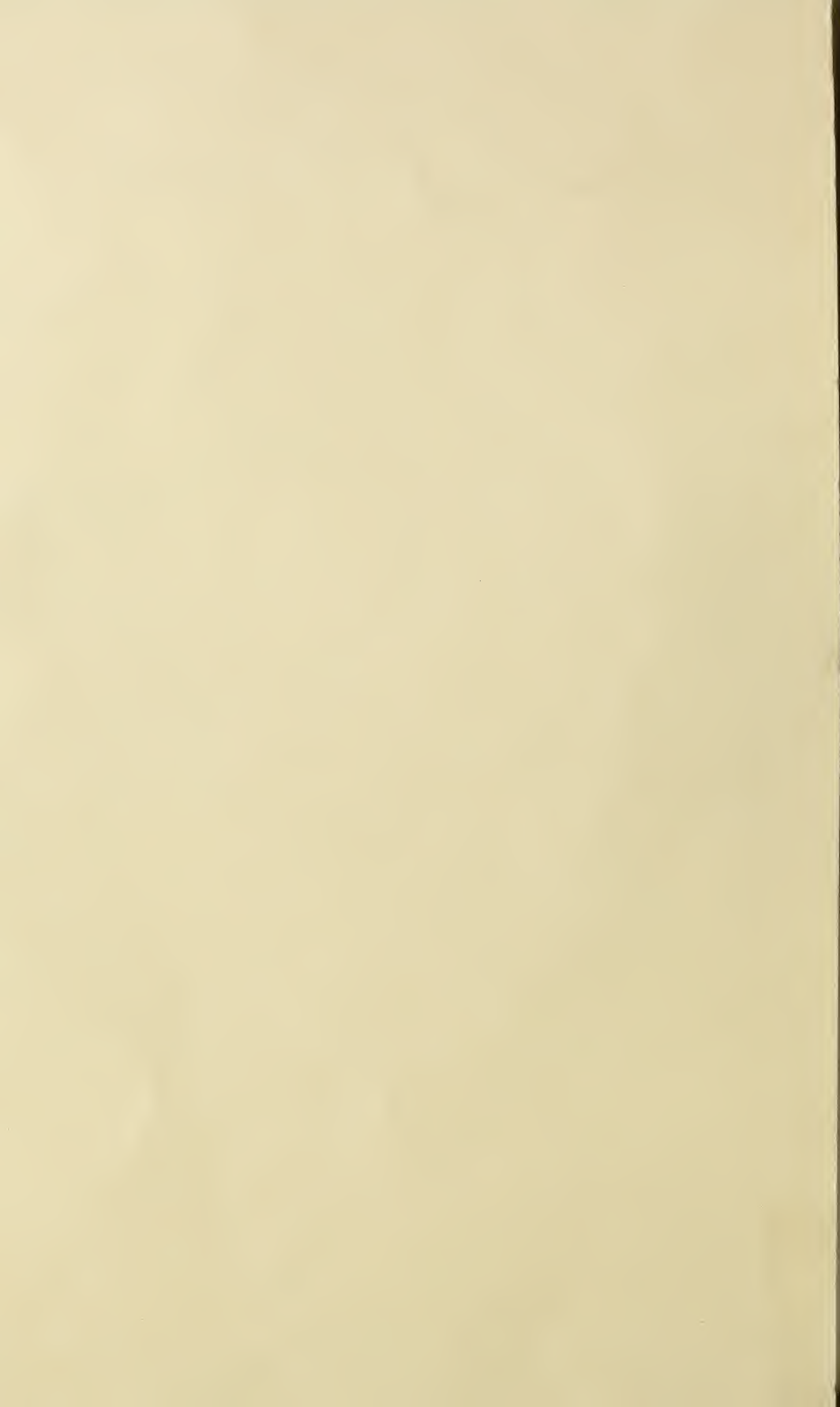


## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



VOLUME XXIII

NUMBER 9

# THE AGRICULTURAL STUDENT

OHIO STATE UNIVERSITY, COLUMBUS, OHIO



MAY 1917

---

OUTLOOK FOR FUTURE HORSE BREEDERS *Donald J. Kays*  
DENOMINATIONS & THE COUNTRY CHURCH *Paul L. Vogt*  
MINERALS IN HUMAN DIETS . . . *L. L. Rummell*  
SHOP TRAINING IN CENTRALIZED SCHOOLS *Eldon L. Usry*

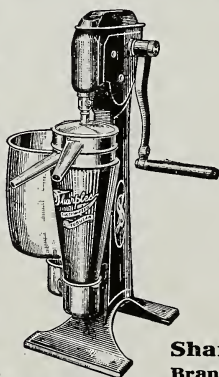
15c PER COPY

\$1.00 PER YEAR



**Over a Million Users!**

P. M. Sharples made the first separator in America (38 years ago). Sharples has been the foremost and highest-class American separator ever since. The Sharples Separator factories are the largest and longest-established in America. Sharples machines are found in every dairying country of the world. The *reason* for this popularity is that Sharples Separators have invaluable patented advantages found on no other make.



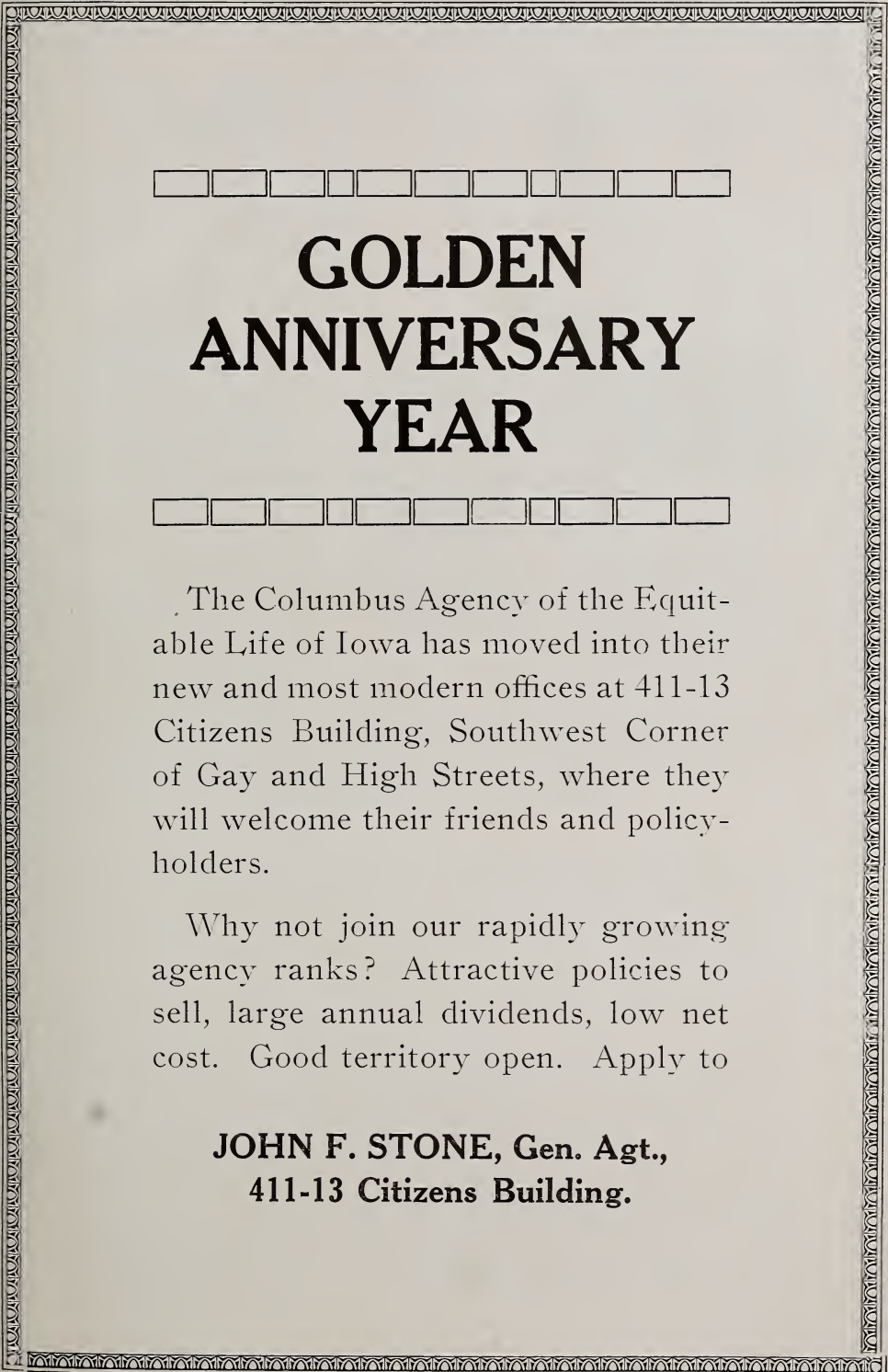
## SHARPLES SUCTION-FEED CREAM SEPARATOR

- is the *only* separator that will skim clean at widely varying speeds.
- is the *only* separator that will give *even* cream at all speeds.
- is the *only* separator that will skim your milk quicker when you turn faster.
- is the *only* separator with just one piece in the bowl—no discs to clean.

Many other strong exclusive features. Write for catalog to Dept. 115

**Sharples Separator Co. - West Chester, Pa.**  
**Branches: Chicago San Francisco Portland Toronto**





□ □ □ □ □ □ □ □ □ □

# GOLDEN ANNIVERSARY YEAR

□ □ □ □ □ □ □ □ □ □

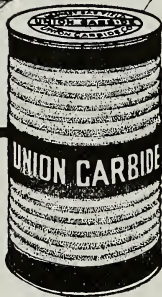
The Columbus Agency of the Equitable Life of Iowa has moved into their new and most modern offices at 411-13 Citizens Building, Southwest Corner of Gay and High Streets, where they will welcome their friends and policyholders.

Why not join our rapidly growing agency ranks? Attractive policies to sell, large annual dividends, low net cost. Good territory open. Apply to

**JOHN F. STONE, Gen. Agt.,  
411-13 Citizens Building.**



To Light  
Your House and  
Barns



To Cook  
Your Breakfasts  
and Dinners

## Union Carbide Gives Your Country Home This Two-in-One Service

**CARBIDE LIGHTS** are as brilliant as the cities' best - they shine from handsome bronze fixtures - they are commonly equipped to turn on without matches.

**CARBIDE COOKING RANGES** are just like city gas ranges - they furnish heat on tap - instantaneous - steady - uniform heat, without kindling, ashes or fuel to handle.

Fifty pounds of **UNION CARBIDE** will run a single **CARBIDE LIGHT AND FUEL PLANT** for weeks.

Without attention the plant will automatically "feed" the range in your kitchen, and as many lights as you care to install in your house and barns.

The beauty and convenience of the light will double the charm of your fireside hours - and the modern gas range will bring relief from kitchen drudgery to the woman who cooks your meals.

During the past fifteen years these **CARBIDE** Lighting and Cooking Plants have been tested, by country home folks, in competition with hundreds of different lighting plants invented during the same period.

While most of this army of lighting plants have lived a day and fallen by the wayside, the **CARBIDE** Plant alone has survived and gained steadily in popularity.

One and all, the hundreds of thousands of **CARBIDE** Plants now in use are practically indestructible - they last most a lifetime.

Instead of daily attention, the **CARBIDE** Plant needs monthly attention - instead of constant repair, it needs none at all - instead of a single service, it furnishes double service - two in one - twice the value for your money.

We would like to answer any question about the **CARBIDE** Plant you care to ask - we can send you too, if you wish, with our compliments, intensely interesting Booklets telling you why the light flame is the coolest of all - and the cooking flame the hottest - why the light is called artificial sunlight - how it grows plants the same as sunlight - why the **UNION CARBIDE** in one hundred-pound drums (always colored blue and gray) is as easy to store as coal - why it won't burn - why it can't explode - how we sell it direct at factory prices to most a million users and distribute it through two hundred warehouses scattered all over the United States.

Write us today for this wonder story, and ask us the hard question you have in your mind - just address

**UNION CARBIDE SALES COMPANY**

Dept. No. 6. 42d Street Building, New York  
Peoples Gas Building, Chicago  
Kohl Building, San Francisco

# Peters' Proven Products

Quality Alfalfa Feeds  
Are Clean Feeds Made in a Clean Mill  
That's Important

We wish to call your attention particularly to the following feeds---these we can conscientiously recommend to you for quality, economy, satisfactory results

## Peters' Hog-Profit---

A good feed for swine---tested by the Animal Husbandry Department of one of the Agricultural Colleges with very satisfactory results.

## Peters' Submilk---

An excellent milk substitute for growing calves---the formula carefully prepared by a recognized feed expert.

**Remember!** These feeds are made by the concern that originated the **Famous Peters' Arab Horse Feed**

We also make Molasses and Alfalfa Feeds---Dairy Feeds---Poultry Feeds---Alfalfa Meal



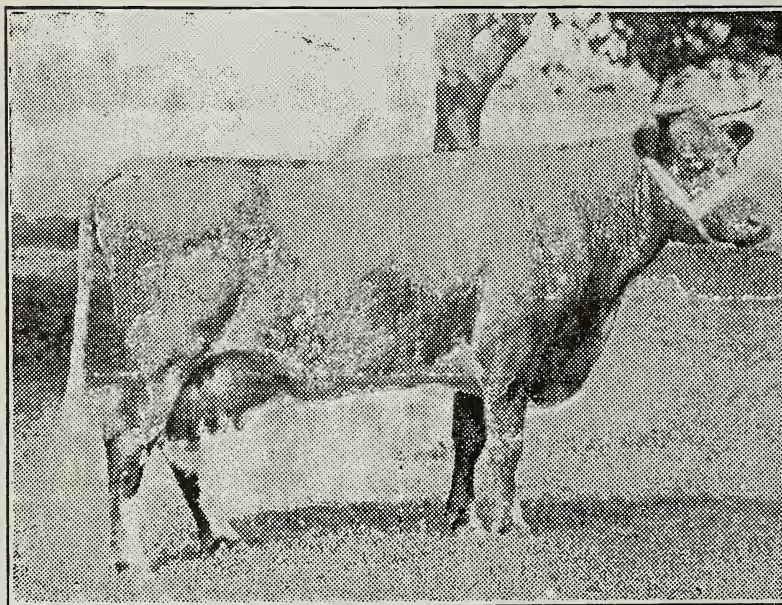
## M. C. PETERS MILL CO.

SOUTH SIDE STATION  
OMAHA NEBRASKA



# The Otis Herd of MILKING SHORTHORNS

Willoughby, Lake Co., Ohio



Tannenbaum  
Farm



Young  
Stock  
For  
Sale

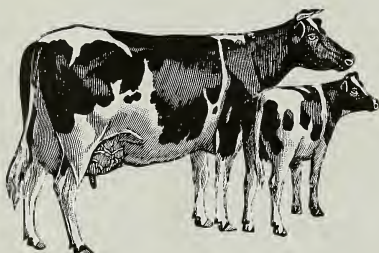


R. M. Dodington,  
Manager

Weight 1,600 lbs.

IMP. BRITISH ROSE

Record 10,000 lbs. a year.



## Purebred Registered HOLSTEIN CATTLE

The ideal milk and beef form is represented by the registered purebred Holstein. It has a higher percentage of weight in the hind quarters than any other breed. Its beef is of high quality. Holstein calves are large, healthy, and easily raised, and a Holstein steer inherits from its dam hardiness and the capacity to assimilate large quantities of feed. It makes fast weight gains and is a most economical producer of beef. There's big money in the big "Black and White" Holsteins.

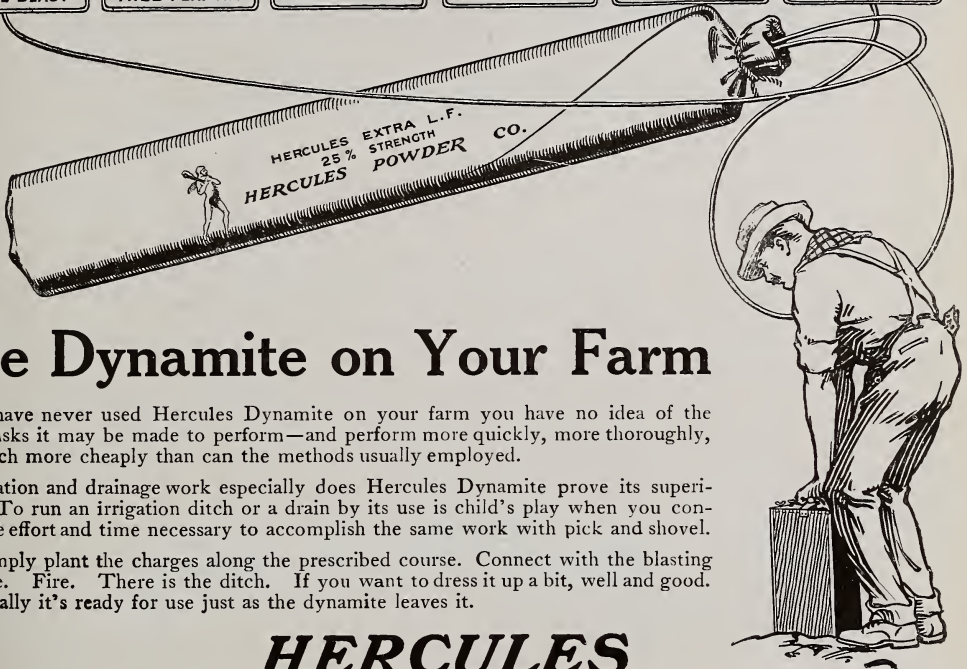
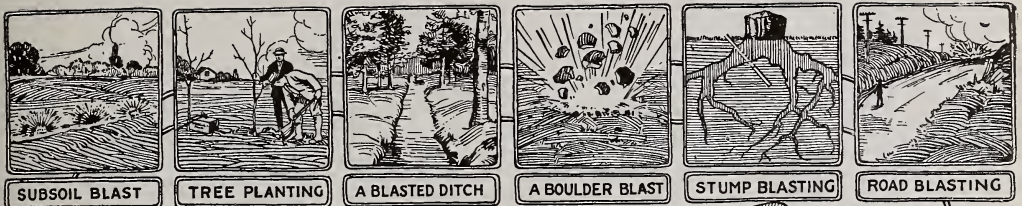
Send for FREE Illustrated Descriptive Booklets.

**THE HOLSTEIN-FRIESIAN ASSOCIATION OF AMERICA.**

F. L. Houghton, Sec'y

Box 154, Brattleboro, Vt.





## Use Dynamite on Your Farm

If you have never used Hercules Dynamite on your farm you have no idea of the many tasks it may be made to perform—and perform more quickly, more thoroughly, and much more cheaply than can the methods usually employed.

In irrigation and drainage work especially does Hercules Dynamite prove its superiority. To run an irrigation ditch or a drain by its use is child's play when you consider the effort and time necessary to accomplish the same work with pick and shovel.

You simply plant the charges along the prescribed course. Connect with the blasting machine. Fire. There is the ditch. If you want to dress it up a bit, well and good. But usually it's ready for use just as the dynamite leaves it.

## HERCULES DYNAMITE

is also most valuable for the work it does in subsoiling—an operation which, by the way, can be performed by no other means.

Every progressive farmer is familiar with the almost phenomenal crop results that have been obtained by subsoiling. Many, however, have not yet tried it on their own land. How about you?

In your own interest, in the interest of your farm, you should write us for a book which we have prepared on

the subject of the use of dynamite on the farm. It is called "Progressive Cultivation", and sent free on request.

In it the subjects already mentioned, also many others such as tree planting, road building, land clearing, etc., are fully discussed and the best methods to follow carefully explained.

You will find the book well worth having. Write for your copy today. Please use the coupon below.

### HERCULES POWDER CO.

6 West 11th Street  
Wilmington, Delaware

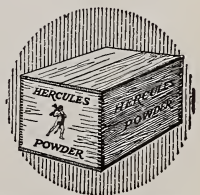
Hercules Powder Co.  
6 W. 11th Street  
Wilmington, Del.

Gentlemen:—Please send me a copy of "Progressive Cultivation". I am interested

in dynamite for \_\_\_\_\_

Name \_\_\_\_\_

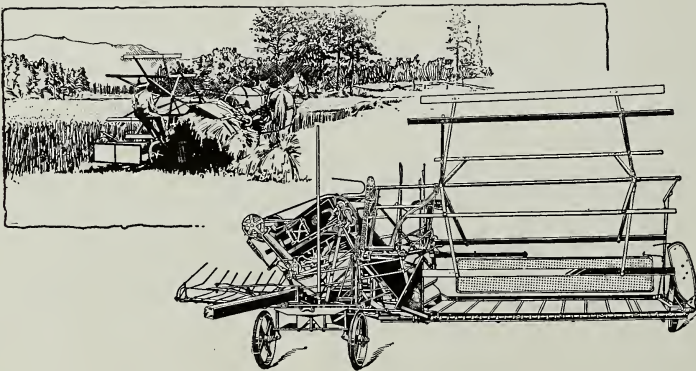
Address \_\_\_\_\_



# International Harvester Binders and Twine and An Unusual Year

This year the American farmer has need of first-class equipment in harvesting machines, twine and binder repairs. He must buy none but well-known, long tried machines and he must buy early.

If his binder is not in first-class condition, he must get genuine I H C repairs for it at once and put it in shape. If it is too far gone for that he must buy a new Champion, Deering, McCormick, Milwaukee, or Osborne binder now, while deliveries can be made and the machines gotten ready for work before harvest time. He will see the local dealer early in the season and arrange with him to have the binder delivered in plenty of time to assure the complete harvesting of the crop.



The twine situation this year is complicated by a number of unusual features, but we are furnishing our customers with twine of as good quality as ever. Quality in twine is more important than price. At the same time, just as a matter of insurance, it will be wise to make twine purchases as early as possible. The dealer will appreciate any aid his customers can give him by placing orders for I H C repairs, twine and harvesting machines at the earliest possible moment.

## International Harvester Company of America

(Incorporated)

Chicago

U S A





### What Can Be Done With Swamplands

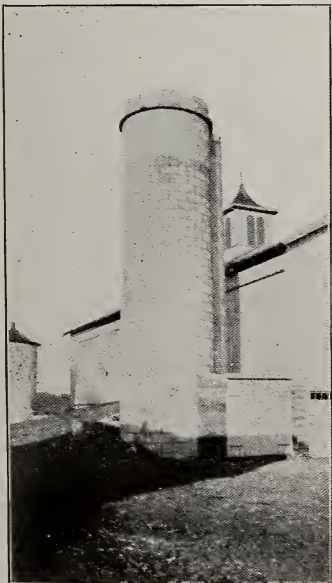
Swamplands can be reclaimed and made profitable by intelligent fertilization. They will produce good corn, onions, potatoes and hay. Their productiveness is not only increased, but maintained

By Using **POTASH** on Them

Use 100 to 200 pounds of Muriate per acre for corn, and the same amount of Sulphate for onions, potatoes or celery. Drill in 75 pounds of Kainit with seed to drive away root-lice or cut-worms.

*Send for FREE literature on this interesting subject.*

**GERMAN KALI WORKS, Inc., 42 Broadway, New York**  
Chicago, McCormick Block      Atlanta, Empire Bldg.      New Orleans, Whitney Central Bank Bldg.  
San Francisco, 25 California Street



## "A Silo Built to Last for Ages"

Storms, wind and weather cannot destroy "PERFECT" silos. Made of everlasting cement blocks, scientifically reinforced, both in the making of the block and the laying up of the silo.

Absolutely fireproof as proven by experience. Guaranteed not to crack. Lowest cost of up-keep. For full information, write

### The Perfect Silo Company

West Park Avenue  
Delaware, Ohio.



## **Branded Commercial Mixed Feeds Safeguard Feeders' Interests**

The Ohio State Feed Laws and good business sense insure absolute uniformity in the analysis of branded commercial mixed feeds. Every manufacturer in order to sell his feed in the State of Ohio must guarantee the analysis and ingredients of his commercial mixed feeds. The reports of thousands of samples taken up by the State Inspectors and analyzed by State Chemists show that commercial mixed feeds are decidedly uniform in mixture and analysis.

There is no assurance as to uniformity in quality of unmixed feed stuffs—there are many different grades of cottonseed meal, distillers' grains, gluten feed, brewers' grains, etc., but a standard commercial mixed feed made by a reputable feed manufacturer is uniform in analysis, and always represents a definite amount of nutrients to the buyer.

### **High War Prices**

Emphasize the importance to the feeders of buying standard commercial mixed feeds whose uniformity is assured, in place of purchasing unmixed feed materials of uncertain feeding value.

The conserving of the various feed materials by leading feed manufacturers in the country is proving a big boon to feeders, making available for feeding purposes millions of tons of feed stuffs, whose feeding values a few years ago were not appreciated.

## **Schumacher Feed**

Is always uniform in quality. It is the same year in and year out, and has been so for almost a half century. Schumacher Feed is the world's greatest carbohydrate mixture for fresh cows, dry cows, young stock, horses and hogs. Practically all feed dealers handle Schumacher Feed; if yours does not, write us.

## **THE QUAKER OATS COMPANY**

Chicago, U. S. A.

# C O N T E N T S

|                                                                         | Page |
|-------------------------------------------------------------------------|------|
| FRONTISPIECE .....                                                      | 542  |
| WHAT IS THE OUTLOOK FOR FUTURE HORSE BREEDERS?—<br>Donald J. Kays ..... | 543  |
| RELATION OF DENOMINATION TO COUNTRY CHURCH—<br>Paul L. Vogt.....        | 546  |
| HEATING ORCHARDS TO PREVENT FROST INJURY—<br>Wendell Miller .....       | 549  |
| PRESENT PLAY, "BETWEEN TWO LIVES"—<br>Guy W. Miller .....               | 550  |
| MINERALS IN HUMAN DIETS—<br>L. L. Rummell .....                         | 552  |
| LIGHT HORSES IN AUGLAIZE COUNTY—<br>William L. Frank .....              | 555  |
| FORM ORGANIZATION FOR COMMUNITY BETTERMENT—<br>Earl L. Johnson .....    | 556  |
| DEMAND FOR DRAFT HORSES CONTINUES—<br>Guy F. Jump .....                 | 557  |
| ADVANTAGES OF INDIVIDUAL HOG HOUSES—<br>Glenn K. Rule .....             | 559  |
| HEATING WATER FOR LIVESTOCK—<br>Edmund H. Vance.....                    | 560  |
| MAKING CONCRETE POSTS ON THE FARM—<br>Victor J. Petry .....             | 561  |
| MILKING SHORTHORN COW MAKES RECORD—<br>Edmund H. Vance .....            | 562  |
| EDITORIALS .....                                                        | 564  |
| HOME ECONOMICS .....                                                    | 567  |
| CENTRALIZED SCHOOL OFFERS ADVANTAGES—<br>Eldon L. Usry .....            | 570  |
| ALUMNI NOTES .....                                                      | 572  |
| CURRENT LITERATURE .....                                                | 574  |
| SHEEP MEN HOLD MEETINGS ON UNIVERSITY CAMPUS.....                       | 575  |







# THE AGRICULTURAL STUDENT

Vol. XXIII.

OHIO STATE UNIVERSITY, COLUMBUS, MAY, 1917

No. 9

## WHAT IS THE OUTLOOK FOR FUTURE HORSE BREEDERS?

**How the Development of the Motor Industry and the Changing Sentiment  
on the Part of the Younger Generation Has Had a Telling Effect  
Upon the Business of Equine Production**

PROF. DONALD J. KAYS, Department of Animal Husbandry, Ohio State University

**E**VENTS have marched swiftly in the last ten or fifteen years. The passing show of the present day, on our city streets and on our country highways, suggests the fact that we are living in an age of gasoline militarism. A glance at the advertisement space in newspapers and trade periodicals, shows that the gasoline driven vehicle as an efficient and economic factor in business, has been and is a much-preached gospel. Truck devotees have pictured "Old Dobbin" with the skids properly placed under him. They have referred to all phases of horse production as on the wane.

Everywhere, the auto truck promoters have employed high salaried and capable salesmen to laud and explain the merit of their wares. They have capitalized the truck in the opinions of business firms by reference to its value as an advertising medium. They have argued long and patiently for the gas-driven vehicle claiming for it maximum efficiency and minimum expense of operation. They have aggregated figures to show that gas power, from an economic point of view has solved the big problems of transportation. They have been extreme enough in opinion to have said, that coincident with the purchase of a truck is the coming of an economic era in business.

True enough, the last few years have

witnessed the development of a tremendous motor truck industry, great enough in scope and organization to influence the business of horse production. It is incorrect, however, to say that all phases of horse production have been dealt a knock-out blow. The draft horse, as a source of power, still plays an important part in solving the problems of transportation. Under the congested conditions of crowded city traffic, the draft horse gets the call on the truck. On long hauls, over good roads, especially in hot weather, the truck is preferred to the drafter. The business firm in our cities, does a great percentage of its business in the crowded down town districts where the horse is most efficient. This explains why the the city draft-horse demand continues. In spite of the motor truck, therefore, the breeder of good using drafters peddles his product with comparative ease.

But the breeders of light-leg equine types have a different story to tell. To put the situation plainly, these breeders have been beset with a feeling of despair as they have watched the automobile tidal wave engulf the land and continue as it does with no evidence of abatement. While the automobile remained the exorbitantly-priced vehicle of luxury, the breeders of speed and pleasure horses had little cause of apprehension. But, with the coming of

the popular priced motor car and finally, the cheap motor vehicle of the present day, the breeder of light-leg horses found himself face to face with real difficulty.

Conditions of the past, contrasted with present day conditions, in the case of the American roadster serve well to illustrate the point in hand. There was a time in the development of the American trotter in this country, when the whole stage from a "horsey" standpoint was almost entirely his. At that

nis matches, no American and no National baseball leagues to pull our heart strings. Card playing was a diversion for the moment only, and our young men had at least the example of their fathers to turn their attention to horses for pleasure and recreation.

In the good old days of horses, buggies, phaetons and victorias, a good brisk drive was deemed a pleasure at any time. Daily drives were the custom. Everybody talked horse and everybody knew some one who



**The Draft Horse Still Plays an Important Part in the Farm Work**

time in this country we knew little of golf or tennis. We had just begun to play baseball. We knew little of the sport of trap shooting. Yachting was confined to the ultra rich. There were no country clubs. Bicycles had not been invented. Motorcycles and aeroplanes were unheard of and automobiles had not appeared to arouse the lust for display, speed, and disaster. We had no Central Park Bridle Path, no great motor speedways, no Belmont Park Marathon Meets, no organized gun clubs, no Interstate Golf and Ten-

drove fast horses. Boys were brought up in a "horsey" atmosphere and longed for the day when they could own a good horse. Today boys talk and dream of operating an air ship or of owning an automobile that can go a mile in thirty-five seconds.

The development of the automobile industry and the consequent change in sentiment on the part of the younger generation, has had telling effect upon the status of the speed and pleasure horses. Speed horses fast enough to lead a big field to the wire are as high



priced as ever. Saddle horses and heavy harness horses, good enough to win in big show ring competitions are exchanging hands at remunerative prices. The auto has failed to eliminate the best of these types from their special field of service, but it has destroyed absolutely the demand for the common or middle classes of horses and has destroyed one of the chief sources of income in the business of horse production. The auto industry has killed the demand for the road horse and for those pleasure horse types of incorrect pattern to win.

In spite of the keenest competition, however, race horse and pleasure horse production will endure. The race asso-

ciations with their rich futurity stakes will continue to solicit the support and patronage of the standard bred breeder. Horse show associations by their efforts will smooth the path and help to make easy the way of the saddle and heavy harness horse enthusiast. Rich men who have horses as their "hobby" will continue to spend their money for good horses, as they have in the past and in this way will help to keep alive the sport of breeding race and pleasure horses. And as the work of these men continues, opposed as they are by the automobile interests, let us indulge the hope that their efforts be successful and that the coming years be freighted only with good things for our equine types.



The Show Helps in Keeping Alive the Sport of Breeding Race and Pleasure Horses



## RELATION OF DENOMINATION TO COUNTRY CHURCH

### Cooperation Necessary for Greater Service in Rural Religious Work.

DR. PAUL L. VOGT, Board of Home Missions, Methodist Episcopal Church, Philadelphia, Pa.

AT the meeting of the commission on Church and Country Life, held at St. Louis, December 6, 1916, a resolution, recommending to denominational controlling boards and officials that they make provision so far as possible for cooperation in the organization and maintenance of community churches or federated churches in rural communities, was adopted. This recommendation affords at least a text and possibly the occasion for the present discussion. It is not my purpose, however, to confine myself to the text as the relation of the denomination to the community church idea can be better understood if certain other more comprehensive plans involving interdenominational cooperation are first discussed.

In the first place, I believe it is agreed that our cooperative activities have as one fundamental aim the building of Christian civilization in every community. The accomplishment of this aim requires the increasing of the efficiency of each denomination in the performance of the tasks that fall to it and the coordination of the efforts of each denomination with those of other denominations so that there will not be unnecessary duplication of effort; so that there will not be areas that are not receiving adequate religious service; and so that there will not be unchristlike competition between denominations so located that they must serve the same communities.

Religious organization in rural America, except perhaps in those sections we are accustomed to designate as "frontier," has already developed to the point where indiscriminate church extension by denominations re-

gardless of the possibilities of service by other denominations in communities concerned ought no longer to be carried on. If this be true, it would appear to be a part of true statesmanship for all the denominations to cooperate in the collection of such information as to relation of present religious organization to community life as will enable each denomination to know better what its particular field of service is.

A survey of the distribution of churches of different denominations in typical areas shows that certain denominations appear to be strongest in given areas of the state and that these groups have outlying points widely scattered over the entire area. Now, if it be accepted that it would not be good policy for the Methodists, for instance, to try to plant new churches in areas already efficiently covered by Presbyterian, United Brethren or other denominations, it follows that economy in church administration for the different denominations would result if each denomination would plan to centralize its efforts on those areas in which it now has a good foundation and if other denominations would, so far as possible cooperate with any given denomination by giving it opportunity to still further centralize its efforts in areas where it is already strong thru exchange of fields.

The time has come in rural religious work as it has in agriculture when it is no longer advisable or possible to exploit new fields and intensive cultivation of areas already appropriated must take the place of extensive activities. That there is a large oppor-

tunity for Protestants for intensive cultivation is evidenced by the fact that studies in all parts of the country show that less than 40 percent of the rural population is now actively connected with religious work. If the present effort at church extension on a competitive basis can be displaced by co-operative efforts at intensive cultivation, not only should communities be more effectively served but also the several denominations concerned should be materially strengthened.

Rural church maps showing typical existing conditions in the older agricultural areas so far as location of churches, residences of pastors, and distribution of denominations is concerned, indicate that many areas are not adequately served by rural pastors. They are compelled to be denominational representatives instead of community servants. Instances are to be found in many counties where men travel from 40 to 100 miles to serve a denominational church. It is manifestly impossible for any pastor to do effective service under such conditions. Many areas are served by several pastors, working independently of one another and without any constructive community program. In some places, there is a lack of adaptation of church buildings to community life, or in other words, some areas are under-churched while on the other hand, areas are over-churched.

The solution of the problem is for the representatives of the different denominations concerned to arrive at some plan whereby each denomination will be held responsible for the pastoral service in given areas, thus assuring to every rural family pastoral oversight. The community church idea is one that probably all would accept as the ultimate aim. But all would also probably agree that for some time to come any

extensive introduction of community churches cannot be expected, because of the deep-seated beliefs of the people themselves; because of the habitual reactions of the people which make them cling to a particular church even though they are willing to waive certain beliefs; because of property interests and denominational organization which prevents rapid change even after the people are ready to combine on a community church; and because of the almost utter lack of information as to inter-denominational conditions throughout the United States which would afford a basis for wise action in the introduction of community churches. In view of the difficulties of introducing the community churches at once it would appear that advance should be made along lines that will strengthen the church in its relation to the community while at the same time avoiding the difficulties involved in attempting to establish the community church.

In the apportionment of rural areas among the different cooperating denominations in order to insure pastoral oversight, the residence of the pastors rather than the location of the churches must be made the basis for distribution. Effort should be made to assign to each resident pastor some territory for which he will be held personally responsible. His business will be to visit every family in the territory, whether belonging to the church or not. His visiting is not to interfere with the pastoral visits of other ministers who may have members living in his territory. Those are to cooperate with him and with them in strengthening the religious life of the community. The assignment of an area to a given pastor is not to prevent other pastors in the same field from taking part in constructive community programs. But it will centralize responsibility for the construction of

such programs in the hands of some one pastor, thus giving continuity to the work. Other communities will be under the direct charge of other denominational representatives. Thus will be eliminated the present inexcusable situation where vast areas are without pastoral care and wherein the church is effectively handicapped in its attempts to carry out any community program.

This proposal must be recognized as a tentative one. It is recognized that many local factors, of which those in the central office cannot know, must finally be taken into consideration before final adjustment can be made. But it is believed that if local pastors and laymen will take the plan proposed for their own area and after careful consideration, submit recommendations for improvement, results can be obtained that would be impossible without the preliminary adoption of some tentative plan.

Each denomination should emphasize the principle that its local church is a community church. Adherence to this ideal will involve the acceptance of the principle that the church exists for the sake of building a Christian civilization in the community instead of building itself up as a church. The church with the community idea need not worry about its own success or failure. Such organizations as really serve the community are appreciated by the community. It will also involve recognition of the principle that the minister belongs to the community as a whole, to the non-church members as well as to the church members. It will also require a strict adherence to the principle that if community interests demand it, church organization must be given up or altered to meet the community need. The recognition of these

principles will render easier interdenominational cooperation for community welfare.

In case the denominations are not in a position to federate for common religious worship, they should by all means work out some plan whereby they can cooperate in the conservation of the social and recreational life of the community. Differences in worship, religious education or doctrine may be continued under denominational auspices but social service should not be handicapped by those differences which do not have a vital relation to Christian social life in the community.

In destitute communities, where it is demonstrable that present denominational organization is not coping successfully with the religious problems, some interdenominational plan of action should be agreed upon, whereby the religious life may be conserved and improved by the united action of all denominations. This may be done thru federation; or assignment of such territory to some one denomination.

Where community cooperation is not strong, higher authorities in the church should encourage ministers in the field in preaching the doctrine of community Christian fellowship.

At the present stage of development about all that can be insisted upon is the necessity of interchurch cooperation in dealing with those problems of community life which demand united community action. When churches practice as well as preach brotherhood, and when they get the vision that Christianity is a greater thing than a denomination, then the solution of the problem of effectively coping with the conditions which threaten the very existence of the church in many rural and village communities will be much simpler.



## HEATING ORCHARDS TO PREVENT FROST INJURY

### How Fruit Growers in Delaware County Save Their Apple Crop

WENDELL MILLER, '18

**O**RCHARD heating for the prevention of frost injury was first tried by the orchardists near Delaware, Ohio, in the spring of 1913 with the result that a \$14,000-crop of apples was saved by one grower and similar results were partially obtained by two other extensive apple growers. Crude oil was used as fuel and the heaters were oblong sheet iron boxes with a capacity of 3 gallons each. The first trial was only partially successful due to the lack of sufficient heaters and knowledge of their proper management. The fruit saved much more than paid their first cost and the cost of fuel so that the men would not now go thru a season without setting out the heaters.

The oil is stored near the center of the orchard in large concrete cisterns with outlets on the hillside below the cisterns so that the tank wagons used for distributing the oil can be filled by gravity. Three men fill two or four lines of heaters in one trip across the orchard with two hose lines. Covers on the heaters keep out water and prevent evaporation of the oil while waiting for Jack Frost. In 1914 the temperature never dropped to the danger point and so the cost of filling the heaters was the premium on a crop insurance policy.

The following year the observer of the special fruit station of the weather bureau sent out a frost warning on the night of May 17. The maximum temperature of the day was 50 degrees Fahrenheit and the sky was heavily clouded until the wind shifted to the north. By 10 P. M. the sky was clear

and the mercury was falling rapidly. At 1 A. M. the thermometers stood at 30 and were still dropping so the firing squads in each of the three orchards started firing heaters. In each orchard four men were employed, two going ahead to remove the covers and two carried the gasoline cans and torches for firing. It took each gang about 1½ hours to light 3000 heaters. Gasoline is used to ignite the crude oil.

In orchard No. 1 1,600 heaters were used to protect 35 acres of apple trees. Only alternate rows of heaters were lighted and the covers were only withdrawn part way. The oil consumption was thus limited to one-third the full capacity, or about 800 gallons for the 3 hours they were burning. In orchards No. 2 and 3, which lie in one body, 2,200 heaters were lighted. These orchards have good air-drainage but it was the heaters not the air-drainage that saved the crop of 1913. In these orchards all the heaters were lighted and burned at one-third of their capacity for 3 hours. The minimum temperature of 28 degrees came at 1 A. M. and by 2 o'clock the temperature was above the danger point. The unheated orchards of the neighborhood were not seriously damaged by the freeze, but the owners who fired, felt themselves repaid for their trouble and expense. Now the heaters are used every season.

After all danger is past the oil remaining in the heaters is hauled back to the cisterns and the heaters dipped in a rust preventative and stored in a dry shed until the next season.

## PRESENT PLAY "BETWEEN TWO LIVES"

Rural Comedy Enacted for First Time by University Grange Members

GUY W. MILLER, '18

THE University Grange has for the first time been instrumental in getting together a number of its members to devote some of their time to rural dramatics. Their first appearance was in the play "Between Two Lives"

old methods of farming. They maintain that education is the real basis of scientific farming. When their father decides to buy more land instead of improving what they already have, Betty runs away with Will Jefferson, a city



### CAST OF CHARACTERS IN "BETWEEN TWO LIVES."

Standing (left to right) Gertrude L. Robinson as Abigail Jones; Ralph Bazler as Sam Snipes; Olga Ellfritz as Sarah Wilson; Paul B. Sears as Henry Wilson; Guy W. Miller as Will Jefferson; Clarence M. Baker, prison guard.

Sitting: Dorothy B. Lowe as Gertie Bowers; Tom C. Stone as Jack Wilson; Joel S. Coffey as Donald Brooks; Ruth Megathy as Betty Wilson; Brenton C. Zimmerman as Silas Watson.

Front row: Theodore J. H. Wiegand as Rastus Washington Lincoln; Orpha N. McCartney as Trueletta.

given on January 29 of Farmers' Week and repeated February 13 for the Grange and University students.

The play is a rural comedy in three acts and portrays the passing of the old and the coming of the new in country life. The scene of the first act is in the country home of Silas Watson, a farmer of the old type. His son and daughter Jack and Betty are tired of the life of drudgery they are forced to lead and rebel against their father's

youth with good clothes. Jack and Donald Brooks, a neighbor's son rescue Betty who marries Donald soon after. The second act shows them in their city home where Jack attends the agricultural college and Donald works on the University farm. Jack completes his college course and Gertie Bowers, a school teacher from home comes to attend the commencement. Mrs. Wilson arrives unexpectedly and pleads with them to return home. They con-



sent to go back to the farm which is very much in need of them.

The third act represents the farm home of Henry Wilson which has been made modern in every respect. The farm has been put on a paying basis under the management of Jack and Donald and with the financial aid of Silas Watson who lends money, Henry and Silas become convinced that scientific farming pays when the alfalfa is harvested and a mortgage which has been hanging on for 10 years is lifted at the end of the first year. The play ends with the announcement of the engagements of Jack and Gertie; Sam the hired man and Abigail a neighbor girl; Rastus and Trueletta, colored servants.

The following cast of characters were selected from the College of Agriculture: Henry Wilson, a farmer of the old type, Paul B. Sears, of the Botany department; Sarah his wife, Olga L.

Elifritz; Jack, his son, Tom C. Stone of the department of animal husbandry; Betty their daughter, Ruth Megathy; Gertie Bowers, the district school teacher, Dorothy B. Lowe; Donald Brooks, a son and neighbor to the Wilsons, Joel S. Coffey of the animal husbandry department; Silas Watson who loans money, Brenton C. Zimmerman; Trueletta, a colored girl who helps out, Orpha N. McCartney; Rastus Abraham Lincoln, colored hostler to Silas Watson, Theodore J. H. Weigand; Sam Snipes, the Wilson's hired man, Ralph L. Bazler; Abigail Jones, who sees vileness in all men, Gertrude L. Robinson of the English department; Will Jefferson, a city youth with good clothes, Guy W. Miller; prison guard, Clarence M. Baker of the journalism department. The play was directed by Marjorie L. McCutcheon of the department of English.

### **HORTICULTURAL DEPARTMENT GROWS RARE PLANTS.**

Many peculiar and interesting varieties of plants are continually being discovered in the tropical and subtropical regions especially among the rank foliage of northern Africa and the territory around the Mediterranean sea.

The horticultural department of the Ohio State University for the past year has been making a collection of rare plants from all over the world but mostly from the tropical countries and raising them under glass. About 200 different varieties have been gathered to date and additions are being made as rapidly as possible altho the present unsettled condition has hindered the work considerably.

One of the varieties called "artillery" plant, a broad leafed species

found growing mostly in the Mediterranean region derives its name from the peculiar habit which it has of giving off a rather dense smoke from its leaves when allowed to come in contact with water after having been in a dry atmosphere for several hours. This smoke like mist resembles that which comes from the mouth of a cannon or rifle after firing, hence the name.

Another variety called the "gas" plant, exhales a practically odorless gas from its leaves which will burn freely if ignited. The exact composition of this gas has never been determined. A species of the common rubber plant grows a broad green leaf which is nearly the identical size and shape of a fiddle after it has attained full growth.

R. W. SMITH.



## MINERALS IN HUMAN DIETS

### Ash Content of Foods Important in Nutrition in Many Cases

L. L. RUMMELL, Ohio Agricultural Experiment Station, Wooster

FOR many years the elements required for the growth of plants have been studied with regard to their characteristics and functions, so that today this question is common knowledge. Likewise, the chemical constituents of the animal body have been carefully and thoroly discussed in certain particulars, and foods have been chosen accordingly to meet physiological conditions of the body.

Nearly all work in human dietetics has been largely confined, as in the case with livestock, to the study of the elements, nitrogen, hydrogen, oxygen and carbon—or, as they are more commonly called when combined chemically in foods, protein, carbohydrates and fat. Highly nitrogenous foods have been placed in the “balanced ration” to supply certain demands for muscle-building material. Then, in order to supply heat, weight and energy, carbohydrates and fat have been selected from a different type of foods. Today after many years of careful research we have abundant evidence of the purpose of these food constituents in the body and how they may be properly supplied.

But what has been done regarding the other elements in the diet? Regarding them most dietitians are silent, because our knowledge is meager and uncertain. Nevertheless, investigations of more recent years point to the fact that the mineral elements or ash (the part remaining after the food is burned), warrant serious consideration in certain cases.

Ordinarily, we need not pay attention to supplying mineral nutriment to our bodies, for our common American diets,

of sufficient quantity and variable character, supply it in abundance. Then, too, the average man does not care to have his meals planned to supply particular elements even if this were necessary. However, it cannot be doubted that under certain conditions, more especially concerned with growth, a study of proper mineral nourishment is imperative.

#### Results of Mineral Deficiency.

Effects of a deficient amount of minerals in the body have been studied mainly in the case of domestic animals. It is true that scurvy in soldiers and sailors, and rickets in children have been familiar for many years. Nevertheless, we must turn to the nourishment and nutrition of livestock for our information on mineral metabolism. Since their bodily structures are analogous, the deductions will be applicable to the human form.

When minerals are withheld from calves, rickets develop, as shown by soft, friable bone. The general conformation of colts has been improved by feeding small quantities of calcium phosphate.

Of all domesticated animals swine are most frequently affected. Dr. E. B. Forbes, of the Ohio Experiment Station, found that while they may grow as rapidly on rations deficient in minerals, their bones lack density, are usually deformed, fragile and light in cross section. For these reasons hogs are often crippled when shipped to market. On pasture they must get sufficient mineral nutriment from the earth and from animal foods, but in closed yards, where they are often fed rations composed largely or exclusively of corn,

they cannot supply bodily demands in this respect. Growth, then, is concerned with an unusual demand for mineral salts.

Milk production involves a heavy draft upon the mineral stores of the body, often as great as the demands for growth. Doctor Forbes after 2 years' investigations with cows yielding large quantities of milk on common farm rations has demonstrated that the body is actually robbed to make good the losses during heavy milk production. Calcium, magnesium and phosphorus were lost in greatest amounts. Even when easily soluble salts like calcium carbonate and bone flour were added to the rations, equilibrium could not be maintained in the case of lime. He concluded that the skeleton loses some of its mineral store in the case of heavily milking cows on common practical rations, and that the loss is made up when milk production lessens or ceases.

Experiments have been conducted by other investigators using rabbits, dogs, mice, pigeons and guinea pigs as subjects. All the results likewise show that greater mineral nourishment is required during growth than after maturity is reached, and that the functions concerned with reproduction involve even greater drafts upon the mineral reserves. Of the mineral elements calcium is the most important because it is most frequently deficient in foods and is easily drawn from the body at times of a lack of mineral nutriment.

#### Mineral Content of Foods.

The more common foods are arranged in the accompanying table to show the differences in mineral content in different types:

#### Composition of Foodstuffs.

(Percentage based on dry balance.)

| Fruits:             | Protein | Ash   |
|---------------------|---------|-------|
| Apples .....        | 0.24    | 1.807 |
| Bananas .....       | 1.13    | 2.925 |
| *Ripe Olives.....   | 1.70    | 3.400 |
| Dates .....         | 2.26    | 1.920 |
| Prunes .....        | 2.78    | 2.845 |
| Vegetables:         |         |       |
| Potatoes .....      | 1.97    | 3.815 |
| Cabbage .....       | 1.16    | 7.189 |
| Navy Beans.....     | 22.23   | 4.420 |
| *Cooked Beets.....  | 2.30    | 1.600 |
| *Spinach .....      | 2.10    | 2.100 |
| Onions .....        | 1.64    | 4.304 |
| Cereals:            |         |       |
| Wheat Flour.....    | 9.74    | .192  |
| Corn .....          | 8.69    | 1.410 |
| Bolted Cornmeal.... | 8.52    | .790  |
| Pearl Hominy.....   | 6.88    | .600  |
| White Bread.....    | 9.22    | 1.695 |
| Oats .....          | 10.88   | 3.709 |
| Rice .....          | 6.48    | .315  |
| Rice Polish.....    | 12.48   | 8.024 |
| Mutton .....        | 17.18   | 2.386 |
| *Beefsteak .....    | 15.20   | .700  |
| Skim-milk .....     | 3.21    | 7.168 |
| *Cheese .....       | 25.20   | 3.800 |
| Eggs .....          | 12.93   | 3.463 |

\*Based upon Federal analyses; all other analyses are taken from Ohio Agr. Exp. Sta. Bul. 255.

From this table it will be seen that milk and its products are important foods to supply mineral matter, and that eggs, vegetables and fruits are likewise significant. The cereals are lowest in ash, especially those from which the outer coverings have been removed.

When one considers the high mineral content of fruits in proportion to the small amount of protein and the high moisture content, he can readily un-



derstand their importance in the diet. Most fresh fruits have about 80 percent water, and can supply iron and other mineral constituents without unduly increasing the supply of protein or energy. Fruits are also fairly rich in calcium.

Vegetables also have considerable quantities of lime; and phosphorus and iron are abundant in peas and beans, the latter element being abundant in all green vegetables. Cooking vegetables often involves considerable loss in minerals. The soluble salts are lost when the water in which the vegetables are cooked is drained off. This cooking water should be utilized provided the food is not thus made less acceptable.

Those foods lowest in minerals are the cereals. Because of their concentrated character such foods are likely to be constipating. The outer seed coats are much richer in ash and supply bulk to the diet, so that a tendency to constipation may be overcome. Fruits and vegetables have the same character to commend them. Bolting cornmeal reduces the ash content more than one-third, but the protein is scarcely reduced at all. The ash in rice is reduced one-half by polishing, while the

protein content is only one-eighth less. Hominy has about one-third the ash content of corn, the cereal from which it is made. Oats furnish nutriment in the best proportion, with wheat second and corn last. Breakfast foods are similar in composition to the cereals from which they are made. They generally lack the seed coat.

Milk contains more calcium than saturated limewater, because the element is held partly in suspension and partly in solution. Milk is also comparatively high in phosphorus. Whenever these two elements are deficient in the diet, they may be easily and economically supplied by milk and its products. Eggs and beef supply considerable quantities of iron, and vegetables and the whole grains do also.

From what has been said regarding the mineral requirements of lower animals, it may already be assumed by the reader that the demands for growth and reproductive activities are greatest in the life of the human being. So it is that during the growing period children need more mineral salts than adults, and anemic conditions arise from the lack of them.





## LIGHT HORSES IN AUGLAIZE COUNTY

### Influences That Early Breeding Has Had on the Industry of the Present Day

WILLIAM L. FRANK, '17

**H**ERETOFORE Auglaize County was noted for its running and light harness horses. Racing was the leading sport of the day and was indulged in by the old and young alike. In fact a man's reputation often hinged upon the kind of horses he rode and drove, and his ability to beat his neighbors in a horse race. The racing spirit, manifested by the large crowds which flock to the races during the county fair, is a tribute to the excellence of the stock of those pioneer horse fanciers who bred for speed and grace.

Mr. F. M. Bowsher of Hume, Ohio, holds first place among the race horse men of Auglaize County. At one time he owned a few more than a hundred horses, among them were some fifteen or twenty thoroughbreds. Altho Mr. Bowsher owned all kinds and classes of horses, it was his running horses that brought home the trophies from the various fair ground tracks in Ohio, Indiana, Michigan and Latonia, Kentucky, and made his Two Mile Stock Farm famous.

"Hume Boy," a bay stallion, was a winner at Latonia, Kentucky, while his two noted mares—Nettie and Mattie Jackson—were considered among the best thoroughbreds in the Ohio "bushes." Altho Mattie Jackson was very fleet footed, having defeated many noted runners, her stable companion—the large chestnut mare, Nettie Johnson—was probably more valuable because she was able to go the distance. At Lima, Ohio, the latter easily won a mile dash in which there were 9 starters, defeating a good field of horses hailing from Chicago, Michigan, Indiana, and various parts

of Ohio. During the following week at Marion, Ohio, she won the mile dash and the mile heats, after which Mr. Bowsher refused for her the neat sum of \$2,000.

During his racing career Mr. Bowsher did much of his own riding. At the age of 59 years he rode a 3-year-old filly in a one-half mile race at Waynesfield, Ohio. Altho now in his eighty-fourth year he enjoys riding his Kentucky saddle mare, and delights in riding her at full gallop. In the ease and grace with which he sits on his horse, and the management of his mount, Mr. Bowsher is unexcelled by any rider in the country, and is noted far and near for his horsemanship and skill in riding. Because of the infirmities accompanying old age Mr. Bowsher has not tracked any horses for a number of years. However, the type of horse to which he was so partial have continued to be a prominent feature in the livestock industry of Auglaize County. Light horses of no mean character are still to be found thruout the country, many of which are descendants of Mr. Bowsher's noted runners.

The thoroughbred is still in evidence among the purebred light horses. In addition many light horses thruout the country are grade thoroughbreds and standard breds, usually with the trotting blood predominating in the light horses of the mixed breeding.

Bourbon Patchen with a record of 2:09 is now owned in Buckland, Ohio, and at the age of 23 is still full of vim and vigor.

Platt Jr., a standard bred pacer was presented to Auglaize County's famous

baseball pitcher, Bob Ewing, by his admiring friends. Platt Jr. made a record of 2:11½ and has paced a trial mile in 2:05½.

Interest in the standard bred is waning. At present he is used almost exclusively as a driving or cheap farm and delivery wagon horse. There are so many misfits, and autos are becoming so common that it is not likely that much attention will be given to the production of light harness horses in the future. Good ones will command prices

but the poor ones will go cheap.

It would be difficult to say to just what extent the light harness and running horses are to blame for the small size of a great many horses now found on the farms. At least a part of the lack of size can be traced to that source, and perhaps the stamina or endurance of many small horses noted for their remarkable strength and lasting qualities can be credited to their thoroughbred ancestry.

---

## FORM ORGANIZATION FOR COMMUNITY BETTERMENT

### Farmers and Business Men Cooperate to Improve Local Conditions

EARL L. JOHNSON, '18

HOW the farmers are beginning to cooperate with the business men of a county seat is shown by the organization of "Community Builders," at Painesville, Ohio, a town of 9000 which devotes its energies to the promotion of better roads, home trade, more efficient markets, etc.

The association of "Community Builders" was started in September, 1915, mainly by the business men thru the cooperation of a local newspaper. Their original idea was to boost "home trade." Campaigns for home manufacturing and greater cooperative spirit were conducted for several months thru advertising and speakers from Cleveland, Akron, Toledo and Detroit.

To promote community cooperation to the fullest extent the organization saw the farmers around Painesville were really a part of their business units and an invitation was extended to them. A farmers' committee was organized which dealt with rural activities alone.

Thru the activities of this committee appropriations have been secured for

paving several miles of roads leading into Painesville. Now the committee is working for a general market place for farmers in Painesville which will probably be rented to producers at maintenance cost.

The matter of a county agent has been discussed favorably and an agent will probably be selected as soon as the usual arrangements can be made. This is an example of what the farmers are doing in cooperation with the business men.

To become a voting member of the "Community Builders," a fee of \$12 is charged which goes to pay the salary of a secretary, advertising and organization expenses. During the winter, noon-day meetings were held each week and evening meetings are planned for the summer.

There are many towns like Painesville where this same scheme of cooperation could be worked out. It is something which promotes a better feeling between the business men and farmers, as well as to accomplish things of mutual benefit to all concerned.



## DEMAND FOR DRAFT HORSES CONTINUES

### How Profits May Be Increased by Using Mares of Larger Size

GUY F. JUMP, '18

THE demand for the draft horse has never been greater than it is now as is shown by the high prices paid on the market. The greatest demands are from the cities which prefer the gelding to the mare for he is more even tempered, and the mare is more or less restless. The farmer prefers the mare because she can do two things at once—the work in the field and the raising of colts. Many farmers prefer the light-legged breeds for farm work believing that the draft animal cannot stand the heat and is not as active in the field as these lighter-bred horses.

We will admit that the draft mare in foal cannot be jerked and pounded in turning around and on soft footing but by using a little sympathy and respect and considering that she is producing

a colt each year we know that she will pay for her year's feed. Others argue that they have not the time to fool with a colt and that the mare requires a lot more care and feed while she is in foal and raising her colt. A good example of this is the mare owned by Mike Lyons of Delaware County, Ohio, that produced 10 colts in 10 years, which sold for a total sum of \$5300.

As for the men who work and breed the road horses, unless they are speedy or fancy heavy harness horses, their reason from a monetary standpoint is poor, for the automobile has come to stay and its advantages over the road horses are outstanding.

The auto truck is used extensively in the cities and will be used more extensively in the future, but investigation



Five Horse Team on the Farm of George A. Dix, Delaware, O.



shows that on hauls less than 3 miles where the traffic is heavy, the team is more efficient. A survey of the principal cities of the United States made by Wayne Dinsmore, secretary of the Percheron Society of America, shows that 80 percent of the traffic is within a radius of 3 miles so the auto truck will not materially affect the city demand for the draft horse.

have style, quality of bone, hair, and hide, show refinement and femininity about the head and neck, and a good conformation and the under pinning and feet must be of the best. Such mares mated with purebred stallions of the same calibre ought to produce horses that will top the market. It is not necessary that the mares be purebred, in fact it has been proven that the



**Two-Year-Old Fillies Owned by the College of Agriculture**

The type of brood mare for the production of the high-priced draft colts should weigh from 1650 to 1800 pounds, have a blocky, massive conformation, good quality and action and show femininity. She cannot be of the plain sort that is so common, but she must

grade mare is the best for the average farmer and the beginner, for the element of risk is great and it does not require so much capital to start.

The following is a comparison of farm mares weighing 1200, 1450 and 1700 pounds, showing their efficiency.

|                                            |                        |                        |                        |
|--------------------------------------------|------------------------|------------------------|------------------------|
| Weight of mares.....                       | 1200 lbs.              | 1450 lbs.              | 1700 lbs.              |
| Cost of maintenance.....                   | Offset by<br>work done | Offset by<br>work done | Offset by<br>work done |
| Weight of colt at 5 years of age.....      | 1500-1600              | 1650-1700              | 1850-2000              |
| Selling age of colt.....                   | 4½ to 5 yrs.           | 4½ to 5 yrs.           | 3½ to 4½ yrs.          |
| Selling price of colt at 4½ years of age.. | \$140-\$175            | \$200-\$240            | \$275-\$375            |

The colts are all sired by the same stallion that weighs 1950 pounds in breeding condition.

The cost of producing these is practically the same but there is a decided difference in the selling price in favor of the colts from the 1700-pound mares. Colts from mares weighing from 1600 to 1700 pounds should weigh 1200 pounds at 12 months of age, and from 1500 to 1600 pounds at 2 years. These 2-year-old colts may be used for light

work and thus be self-supporting from 2 years of age to the time of maturity. Good geldings weighing 1700 pounds or over at full age, with well set legs and durable feet have averaged around \$350 a head. Draft horses bring more in pairs than when single, if they are well mated, ranging in prices from \$750 to \$800. Good grade mares are averaging from \$200 to \$300 a head. These prices are high enough to leave a satisfactory profit to the breeder of draft horses.

## ADVANTAGES OF INDIVIDUAL HOG HOUSES

GLENN K. RULE, '17

THE relative merits of the two types of hog houses, namely the individual or movable type and the community type are constantly being discussed thruout the corn belt. Possibly the local conditions will largely determine which house is the more desirable, but nevertheless it is questioned by men living in the same community.

Since the economical production of pork depends largely on pasture crops it is desirable to have shelter that is easily moved. In many cases a part of the farm that is some distance from the buildings is particularly adapted to certain crops.

Again in farrowing times one restless nervous or irritated sow may disturb all the other sows in the building. Charles A.ENZ of Morral, Ohio, who keeps twenty sows the year round favors the movable type; one sow does not disturb the rest and when the pigs are old enough he could take them directly to the forage pasture. They are especially desirable when a field of corn is being hogged off some distance from the buildings as it leaves the manure where it is least likely to be hauled.

When sows are kept in large numbers one will farrow occasionally when unexpected. In this emergency the mov-

able type will surely be appreciated.

When considered from the standpoint of sanitation they are much superior, not in construction of the buildings themselves but due to the fact that the animals are not concentrated in any one place, disease and parasites being avoided thru prevention. If the weather is damp and wet the ground immediately surrounding a large house is wet and muddy and if exceedingly dry it becomes dusty. Both conditions are conducive to disease.

The community type of house is more or less expensive. The Iowa Agricultural Experiment Station estimates the cost of a building 25 by 60 feet including twenty pens each 6 by 8 feet to be \$823.52. This is of masonry construction. Another building of frame construction the same size as the one mentioned above would cost \$720.84. The cost of the individual house is small but they can be more easily adapted to the number of stock than the community house. One will always find that he has too many or not enough hogs for the larger house. The initial outlay need not be large for the individual houses. Large houses are expensive to heat and it must often be done for the benefit of but one or two animals.



## HEATING WATER FOR LIVESTOCK

### Contradictory Results Obtained by Different Experiment Stations

EDMUND H. VANCE, '17

THE severity of the past winter has no doubt brought to many stockmen the question of heating water for livestock. The months of December, January and February were exceptional for their cold weather. From the United States Weather Bureau at Columbus, Ohio, we have the following mean temperatures for these months in 1915-1916 and 1916-1917.

|           | Dec.    | Jan.    | Feb.    |
|-----------|---------|---------|---------|
| 1915-1916 | 31.00°F | 36.00°F | 27.00°F |
| 1916-1917 | 30.40°  | 29.80°  | 20.58°  |
|           | .60°    | 6.20°   | 8.42°   |

December of this year was only .6 degrees colder than December of last year but the month of January was 6.2 degrees colder and February 8.42 degrees colder than those months a year ago.

There seems to have been more work done on this subject in connection with dairy cows than with any other line of livestock. Michigan Bulletin No. 41 reports an experiment made with dairy animals running from January 19 for 2 months. Bran, corn meal, ground oats, silage and corn stalks were fed. Water at 60 degrees was supplied every alternate week. Both quantity and quality of the butterfat and the milk were increased by the heated water but it was so slight as to scarcely pay for the heating.

The report of the Wisconsin Experiment Station for 1890 contains the following experiment lasting from January 11 to March 21. Six cows were used, three in each lot. One lot was supplied with water at 70 degrees and the other with water at 32 degrees. A similar experiment had been performed the year previous and both gave prac-

tically the same results. Both lots having warm water gave more milk, drank more water, ate more food, but required less food per pound of milk. The solids in the milk increased with the rise in the temperature of the water. The first year those on heated water gained in weight while the second year the reverse was true.

On the other hand Minnesota Bulletin No. 4 cites an experiment with six cows where the cold water gave the better results. Bulletin No. 7 from the same station deals with a similar experiment carried on in connection with one on the feeding of silage to both milch and fattening animals. The results indicate scarcely any difference between warming the water to 70 degrees and cooling it to 39 degrees when given to cattle in comfortable quarters.

This does not quite accord with the advice given in a small booklet published by T. B. Terry of Hudson, Ohio, entitled "The Winter Care of Horses and Cattle." In his opinion giving water at the point of freezing to cattle fed on high priced grain is an expensive means of heating the water. It is far more costly to indirectly warm the water inside an animal by the heat gained from the grain than it is to heat it outside by applying heat from coal, wood, or oil directly to it. Not only is this true but the use of fuel which should have been laid on an animal in the form of flesh and fat makes it doubly expensive. Certainly the nervous system of so sanguine an animal as a dairy cow is bound to be violently disturbed by the use of ice cold water with the resulting losses in milk and butterfat secretion.



Tho Mr. Terry believes in the use of artificial heating in preference to the use of ice cold water he seems to favor the plan of pumping fresh water each time the livestock need it in amounts just sufficient to supply their needs for the time being. It is a well established fact that springs from any considerable depth seldom freeze over in the most severe weather. The water coming from below the frost line is at approximately the mean annual temperature of that region (about 50 degrees for Ohio) or even warmer. The same may easily be true of the majority of wells in use on the average farm. Consequently water pumped fresh each time it is needed is in prime condition for all livestock.

In this connection it is interesting to note the personal experience recited by a number of men in a livestock management class at the Ohio State University. There seemed to be a concensus of opinion that it pays to warm water for cattle. They take kindly to artificially heated water, consume more of it than if it were cold, and make better gains or give more milk as the case may

be. Two men had also obtained gratifying results in heating the drinking water for pigs being fattened.

However it was also quite generally conceded that horses do not take kindly to artificially heated water. One instance was cited where horses refused water heated to only a medium temperature and went to another tank where they broke the ice to get at the water.

The experiences seem to be quite generally typical; namely, that cattle and swine will respond readily and abundantly to the heated water given them but that horses do not. Due to the fact that horses do refuse artificially heated water, that the installment of heaters sufficient to supply water for all livestock is more or less expensive and somewhat dangerous in many situations artificial heaters are perhaps not practical for the average farmer. This together with the somewhat contradictory results from experiments along this line, would seem to make it an excellent practice to follow the conservative advice of Mr. Terry on pumping fresh water as the stock need it.

---

## MAKING CONCRETE POSTS ON THE FARM

VICTOR J. PETRY, '17

CONSIDERABLE labor may be saved by making concrete posts on a stone boat or farm sled, as the posts can be hauled directly to the field. Green concrete posts develop cracks easily and quickly if hauled any distance. However, when hauled directly to the field comparatively green, they can be laid by the post hole for further curing, without any danger of damaging.

A stone boat 5 feet wide and 7 feet long will hold the forms for 10 posts,

using 2 by 4-inch scantlings to make the forms. However, if inch boards are used a stone boat of this size will hold more. A form 5 feet wide and 7 feet long by inside measurements will hold 12 posts when the 1-inch partition boards are inserted. This form can be laid directly upon the stone boat.

The bottom of the posts should be 5 inches wide and the top 3 inches. The partition boards should be inserted accordingly, the top of the first post alternating with the bottom of the sec-

ond and so thru the mold. By filling all the molds evenly the partition boards will not bulge.

If reinforcing is desired, 4 holes can be bored in each end of each post form and No. 9 fence wire inserted and drawn tight, by wrapping with a broom stick. When the end of the form is taken off the wires will be free.

A 1-2-3 mixture of cement, sand and gravel respectively will give good re-

sults in making posts if the material is clean. However, if there is more than 3 percent of dirt in the sand a richer mixture should be used.

The cost of making concrete fence posts under a system as this is about 7 cents per post. The cost varies with kind of material used in the forms, the distance the gravel must be hauled and the amount of waste in the way of broken posts.

## MILKING SHORTHORN COW MAKES RECORD

**Under Adverse Conditions She Won Many Prizes at Leading Livestock Shows**

EDMUND H. VANCE, '17

**H**AVING to her credit eleven calves in 10 years, an average of 8451 pounds of 4 percent milk each year, and a record of 10,887.8 pounds of milk for one year, Jewel, a milking Shorthorn cow, property of the Otis herd of milking Shorthorn cattle of Willoughby, Ohio, stands as an excellent example of the kind of individuals to be sought in building up and improving a herd.

During the 14 years of her life, a good part of which has been spent under adverse conditions of fair circuits each year, this cow has twice taken first place in Class A for cows in milk at the International Exposition and stood second in the same class for 1916.

Many another cow may have possessed the best of pedigrees and the requisites of form and quality for winning in the show ring but have also failed as breeders. It seems somewhat of a question as to what real use an animal may be with all of its pedigree and fine points unless it can produce progeny to whom are transmitted those desirable qualities of the parent. A cow may win considerable prize money, make large yields of milk, and end her

days as a limited amount of beef yet in no way make more available to the world at large those wonderful qualities which she may possess. Unless she can produce progeny like herself she has failed to attain the highest point of achievement.

One of the most important means of improving our livestock is thru the use of prolific animals carrying in their makeup those ideals for which the breeder may be striving. The normal type of any kind of livestock in this country at the present time does not coincide with the best and most improved lines. The scrub comes nearer to being the predominating or normal type than does the purebred or even the grade animal. This condition exists because it is the poorer type which far and away outnumbers the improved livestock. As the majority rules we are forced to consider the scrub as the prevailing or normal type. Let the conditions be reversed and the normal will be synonymous with the best.

The following table may make more clear the means of attaining our end, the importance of using high class animals of great proficiency.



| Cows      | Generations |   |    |    |     |
|-----------|-------------|---|----|----|-----|
|           | a           | b | c  | d  | e   |
| I .....   | 1           | 1 | 1  | 1  | 1   |
| II .....  | 2           | 4 | 8  | 16 | 32  |
| III ..... | 3           | 9 | 27 | 81 | 243 |

The letters at the top represent successive generations. All calves are considered as heifers for convenience sake. Cow number I produced one calf before she stopped breeding. This heifer in turn produced only one calf before she, too, stopped breeding. The same is true for all the remaining generations. Cow number II produced two calves. Each of these dropped two making four in the second generation. Cow number III dropped three calves and the same principle applies here, each heifer producing like her dam.

The result of the above is that the cow number I has merely maintained her line. No matter how good a cow she might have been otherwise, no matter how good each of the successive

generations might have been, nothing would have been done to establish a line of animals possessing the desirable characteristics.

Contrast the results of cow number III where, in the fifth generation, there are 243 individuals of the best type. They are well on their way to establish themselves as the normal type crowding out the inferiors. Consider, then, the possibilities of a cow like Jewel which has produced, not merely three, but eleven calves in her lifetime and is not yet thru, at the present time being in calf to British Prince, the winning bull among milking Shorthorns at the International Livestock Exposition this year. One of her progeny, Jeweler by Cyrus Clay, sold for \$1500 while another, Knight's Jeweler, a 3-months-old-bull, sold for the unusual price of \$1000. Her eleven calves sold for an average price of \$640 making a grand total of \$7040 in 10 years.





OF  
OHIO STATE UNIVERSITY.  
A MEDIUM FOR EXCHANGE OF IDEAS BETWEEN COLLEGE AND FARM

Published by the Students in the College of Agriculture.

Established 1894.

Subscription Price, One Dollar the Year.

Entered at the Postoffice at Columbus, Ohio, as Second Class Matter.

STAFF.

R. S. CHRISTEN, '17, Editor-in-Chief.

E. JOSEPHINE JONES, '17, Home Economics Editor.

E. W. BUDD, '17, Secondary Agriculture.

Associate Editors:

I. P. Lewis, '17.

D. G. Coe, '17.

V. G. Applegate, '18.

S. G. Price, '19.

R. W. Smith, '17.

G. W. Miller, '18.

G. L. Brown, '17.

H. G. OLIN, '17, Business Manager.

B. C. ZIMMERMAN, '17, Assistant Business Manager.

H. W. McCHESNEY, '17, Circulation Mgr.

Associate Business Managers:

J. E. Oakley, '17.

C. H. Sprague, '19.

Wm. Cooper, '17.

O. J. Shong, '17.

M. V. Bailey, '18.

J. A. Wilson, '18.

COLUMBUS, OHIO, MAY, 1917

## EDITORIAL

### THE FARMER'S RESPONSIBILITY.

With the entrance of the United States into the world war, the farmers of America are placed under the most insistent obligations as upon them will rest the final responsibility in winning the war. The importance of an adequate food supply especially in this year of low reserves cannot be over emphasized.

The American farmer has long shown his ability to produce more food per man and at a lower cost per unit than any other farmer in the world but he has not had to do his best. In view of this it becomes imperative in this national crisis that the farmer put forth his best efforts to the production of the maximum crops and raise only those that are well adapted to the com-

munity and are likely to yield the highest returns.

Within the next month the final measure of crop acreage to a large extent will have been made. The farmer, however, cannot stop here in his endeavor to raise larger crops. The crop still can be increased by cultivation and further it must be harvested. Caring for the matured crop is often one of the most vital points in production and the demand for labor at this time is greatest. Each year thousands of acres of crops go unharvested because of lack of labor necessary to care for them. To give the farm an adequate supply of labor, therefore, is one of the most pressing problems confronting the American people today.

If the American people will use their

resources most intelligently there will be no need of going on a restricted diet as is now the case in European countries. There is land enough in this country to raise all the food necessary to feed her own people as well as all the people in the warring nations of Europe, but the farmer must be given the proper amount of labor and he must put forth his greatest efforts and ability in increasing the yields.

### **INCREASE FOOD PRODUCTION.**

That this great war will be decided by the food supplies of the fighting armies seems to be an established fact. Patriotism can be shown by the farmers in the furrows as well as by the soldiers in the trenches. Realizing the dependence of the soldiers upon the farmers for food supplies, the government is asking that everything be done to raise the maximum crops this year. It is up to each individual farmer to make his labor efficient and utilize all means possible for raising the food to satisfy a world already hungry.

Lower prices for products need not be feared as the food supply of the world is depleted and would not be sufficient if the war were to stop immediately. Great faith is required to put potatoes, corn and oats in the ground when they are so high in price but there is no evidence that they will be any cheaper for several years to come. Therefore each farmer should be willing to plant every available acre, knowing that he will profit thereby and also help in the great food problem.

Lessons in economical living will be learned in this crisis. We have been having things come and go too easy. Life and its problems have not been taken as serious as they should have been. The American people have been neglectful and thousands of dollars worth of food have been wasted every

year. Our food must be used economically and that which was once thrown away as waste be saved and used in rational ways. When multi-millionaires say that meat must not be on their tables more than twice per week it is time for the average person to think about his manner of living and begin some reforms.

President Thompson said, "I would be ashamed to live luxuriously in these days." This war and the great food problem which it has brought will teach us that the "simple life" is the basis of a strong nation. Now is the time for the American people to show the world that they can live economically and for the American farmer to prove that he has the ability and power to feed the world.

### **CULTIVATE CORN EARLY.**

This is one of the serious times in the growth of a corn crop. Careful cultivation of the corn just after it comes thru the ground has proven a valuable practice. Some say that it is not advisable because the weeder and harrow will break off so many of the young plants and tear the roots up to be exposed to the sun and killed. But there are millions of little weeds being treated in the same way.

The destruction of these weeds in the early stages of growth is important because it gives the corn a chance to get started ahead of them. If they grow up with the corn until it is big enough to be cultivated the chances are that there will be so many that the cultivator will not kill all of them. On the other hand, if the corn is cultivated and the weeds killed it grows faster and matures earlier thus favoring a larger crop.

This cultivation should be done not only to kill the weeds but also to conserve the moisture. If the ground lies



from corn planting until time for cultivating without any stirring or mulching considerable water will be lost that should have been conserved for the latter part of the season.

---

### THE DRAFT HORSE.

In this time of changing methods in transportation on the farm and in the city, the utility of the draft horse is experiencing a period of readjustment. In these changes it is noted that the horse is being relieved of doing a large amount of the heavy service which he has been required to perform in the congested streets. Likewise, the heavier work on the farm is being more and more done by the use of some mechanical power. However fast this change may be taking place it can hardly be predicted as yet that the draft horse will not find a place in agricultural or other work.

The average farmer for sometime to come will always use a large number of these horses and the small farms of 100 acres or less will no doubt use horse labor almost exclusively for at least this generation. The draft horse has a wide range of adaptability that is hard to equal with mechanical power. For short hauls and many stops the draft horse is given preference even in the congested streets of our large cities. On the farm horse labor can be transferred from one kind of work to another without much inconvenience on the part of the operator.

In the production of the draft horse on the farm, the first essential to consider is that of service and utility. The animals used for breeding should conform as closely as possible to the essential requirements of the draft horse. Their basis for consideration should be on breeding and individuality and less

on show records and exploitation. The sire does not have to be an imported animal with a long list of awards to his credit. The home bred sire which until recent years has been given a secondary consideration is now coming into its own, a large number of which are now being bred in this country and can be obtained at a reasonable price. Another advantage in favor of the home bred sire is that an opportunity is given for studying more carefully the breeding and individuals in the pedigree and on the whole there is a better chance to judge of what may be expected in the offspring of the animal.

---

### CATCH FLIES EARLY.

It is commonly supposed that the house fly begins laying eggs as soon as she emerges from her breeding place. If this is true no swatting can accomplish results as young larvae will be continually feeding, growing and maturing in the breeding places of their ancestors who had been swatted after their eggs were laid.

There is a certain lapse of time, however, between the emergence of the adult fly and laying of eggs. This period in which the eggs are being formed is perhaps the most important time in the swatting campaign for if the adult flies are killed or trapped before they lay their eggs, all chances of increase from their offspring are averted.

This period of immaturity is quite short and the time for killing these egg-filled mother flies is limited. It requires concerted efforts on the part of any community to rid itself of flies but if this action is taken it can be done. In this way annoyance from flies will not only be prevented but danger from diseases which they carry will be lessened as well.

# Home Economics Department

## TWELVE DAILY FOOD PLANS FOR FARM MEALS

**A**T the suggestion of some Ohio farm women the home economics division of the agricultural extension department, Ohio State University, has prepared the following plan for serving farm meals. They are outlined to be used for 12 successive days and are arranged for use during the spring months when the supply of some of the different food articles are limited. (Editor.)

The food supplies available for the 12 daily food plans are as follows:

Cured pork—Ham and shoulder, bacon. Sausage—Fried and canned. Chickens, eggs, beef (limited), fresh and salt fish (limited), home made bread and butter, milk (home supply), potatoes (limited), turnips, onions (limited), tomatoes (home canned), corn (canned), corn meal, peas (canned), rice, hominy, macaroni, dried lima beans, canned plums, peaches, cherries and apples, dried apples, prunes, oranges (limited), bananas (limited), rhubarb and jellies.

### Economies Considered in the Plan.

Meat seldom served more than once daily.

Potatoes not more than twice daily, substituting other starchy foods like rice, hominy, macaroni, dumplings, crust of meat pie.

Generous use of cornmeal, occasional use of rye flour, to conserve wheat flour.

Omission of ready-to-serve cereals.

Boiled potatoes, boiled in the skin and peeled before serving.

Fuel, economized by use of the oven for more than one thing at a time.

If white sauce is used often for soups and scalloped dishes and for creaming,

a quantity might be prepared at one time for more than one meal.

The same might be done with salad dressing.

No bread or milk is given to chickens or other animals as flour is scarce, neither can we spare the protein of the milk.

### MENUS.

#### Menu I.

Breakfast—Oatmeal, bacon, eggs, toast, coffee.

Dinner—Fricassee chicken, mashed potatoes, brown gravy, rice with tomatoes, cherry pie.

Supper—Macaroni with cheese, baked onions, lima beans, rye bread, dried apples stewed with raisins, cookies.

#### Menu II.

Breakfast—Bananas with cream, creamed codfish on toast, corn bread, coffee.

Dinner—Sausage and brown gravy, potatoes boiled in the skin, escalloped turnips, peach shortcake.

Supper—Rice croquettes (with left-over chicken enclosed), creamed scrambled eggs, apple tapioca.

#### Menu III.

Breakfast—Cornmeal mush, fried bread, bacon, coffee.

Dinner—Escalloped ham and potatoes, corn fritters, jelly, cream pie.

Supper—Potato soup, hominy with chipped bacon, cottage cheese, gingerbread, apple sauce.

#### Menu IV.

Breakfast—Fried mush, brown sugar syrup, ham, coffee.

Dinner—Sausage in brown gravy, mashed potatoes, peas, peach salad, suet pudding with lemon sauce.

Supper — French rarebit (cheese fondue), creamed onions, rhubarb sauce, poor man's pudding (baked rice and milk and sugar.)

#### Menu V.

Breakfast — Stewed prunes, potato cakes, poached eggs, coffee.

Dinner — Beef stew with dumplings, baked corn, peach pie.

Supper — Macaroni with meat (left-over stew), creamed eggs, corn muffins, fruit pudding, cookies.

#### Menu VI.

Breakfast — Hominy with milk, bacon, potatoes, coffee.

Dinner — Boiled ham, mashed potatoes, escalloped tomatoes, creamed turnips, cornmeal and prune pudding.

Supper — Fish chowder, beans, brown bread (cornmeal and rye flour), apple sauce cake, rhubarb sauce.

#### Menu VII.

Breakfast — Graham mush with raisins, hash (leftover ham and potatoes), coffee.

Dinner — Vegetable soup (made with beef stock), sausage, baked potatoes, creamed onions, rye bread, cherry dumpling with cherry sauce.

Supper — Macaroni with tomato sauce, succotash, baking powder biscuits with honey, cup custard, cocoa.

#### Menu VIII.

Breakfast — Ham, eggs, warmed over baking powder biscuits, coffee.

Dinner — Meat pie (soup meat with mashed potato crust), corn, dandelion salad, chocolate cornstarch pudding.

Supper — Ham omelet, potato croquettes, corn bread, cherry sauce, sponge cake.

#### Menu IX.

Breakfast — Sliced oranges, ham, potatoes, warmed over cornbread, coffee.

Dinner — Salt pork, potatoes boiled in skin, egg sauce, creamed lima beans, rhubarb shortcake.

Supper — Lima bean soup, hominy

with cheese, egg salad, plum sauce, cookies.

#### Menu X.

Breakfast — Oatmeal, bacon, poached eggs, coffee.

Dinner — Sausage, mashed potatoes, hominy with tomato sauce, cornbread, dried apple and raisin pie.

Supper — Warmed over potatoes, creamed onions, cottage cheese, peach tapioca.

#### Menu XI.

Breakfast — Rice, boiled eggs, bacon, graham muffins, coffee.

Dinner — Chicken pie, mashed potatoes, escalloped corn, steamed cornmeal pudding, rhubarb sauce.

Supper — Salmon croquettes with white sauce, peas, corn pone, fruit gelatine, cake.

#### Menu XII.

Breakfast — Stewed prunes, creamed chicken on toast, doughnuts, coffee.

Dinner — Boiled ham, boiled potatoes, escalloped tomatoes, custard pie.

Supper — Escalloped potatoes, lima beans, cornbread, stewed dried apples, cookies.

Where other bread is not mentioned, white bread is intended.

Coffee and tea for dinner and supper are not mentioned. Limiting their use, if reasonable under the circumstances, might be some economy.

From the point of view of variety in diet and perhaps an economy in time of preparation pie is not used for desert for every dinner.

Recipes given are not accurately worked out for a definite number of servings but are supposed to serve six.

### RECIPES AND EXPLANATIONS.

**Fricassee Chicken** is rolled in flour, browned in hot fat, some water added, covered closely and allowed to simmer till tender—1½ to 3 hours.

**Baked Onions** have the outside layers



left on and are baked and served same as baked potatoes.

**Scalloped Turnips**—Turnips are cut in cubes, boiled till tender and scalloped same as oysters, with crackers and milk.

**Peach Shortcake**—The shortcake is a baking powder biscuit dough.

**Rice Croquettes** when made while rice is warm will cling together without a binding material. Egg must be added and thereby increase the food value. Croquettes are rolled in bread crumbs prepared from stale or leftover pieces of bread. It is economical, and desirable from the quality standpoint to fry in deep fat.

**Creamed Scrambled Eggs**—To each egg that is scrambled add  $\frac{1}{4}$  cup white sauce (milk gravy.)

**Sausage in Brown Gravy**—Brown gravy is made by browning some white flour, adding some of the sausage fat, and water or milk to make the desired consistency. To this is added the sausage, whole or broken.

**Peach Salad**—The peaches, drained of their juice, may be used alone or combined with some other fruit. Cooked salad dressing was intended.

**French Rarebit**—4 large slices of bread, 4 tablespoons butter, 5 tablespoons cheese,  $\frac{1}{2}$  teaspoon salt, 2 cups milk, 2 eggs, cayenne pepper, mustard.

Fill baking dish with alternate layers of bread, which has been sliced, spread with butter and cut into small squares, and cheese, either grated or ground. Moisten this thoroly with a mixture made of 2 cups milk, 2 eggs, salt, pepper and mustard. Cover with buttered crumbs. Bake until thoroly heated thru and browned on top. (This will serve six people.)

**Fruit Pudding**— $\frac{1}{2}$  cup fruit juice,

2 or 3 cloves, nuts,  $\frac{3}{4}$  cup water, sugar to taste, 2 tablespoons cornstarch,  $\frac{1}{8}$  teaspoon salt.

Heat water, juice and salt. When boiling stir in the cornstarch which has been mixed with a little cold water. Stir until it thickens, over the direct flame—add cloves and sugar. Cook  $\frac{1}{2}$  hour in double boiler. Add nuts or fruit and pour into molds. Chill and serve plain with fruit or cream.

**Cornmeal and Prune Pudding**—1 teaspoon salt,  $\frac{1}{4}$  cup cornmeal, 1 cup prunes, cut fine after being soaked, 1 cup molasses, 6 cups milk, 2 eggs.

Cook the meal with 4 cups milk, add the prunes and salt. When cool add beaten eggs. Pour into baking dish and bake about 3 hours. Add remainder of milk during the baking when necessary to stir it.

**Fish Chowder**—2 ounces salt pork, 1 quart milk, 1 tablespoon chopped onion,  $\frac{1}{2}$  pound fish, salt or fresh, 3 cups dice potatoes,  $\frac{1}{4}$  pound crackers.

Soak salt fish in cold water and break into small pieces. Cut pork into small pieces and heat till light brown. Add onions and brown them. Add potatoes. Cover with water. Boil till potatoes are tender. Add milk and fish. Add crackers just before serving.

**Cherry Dumplings**—To a sweetened baking powder biscuit dough is added cherries, drained of their juice. This is steamed. The juice is used for the sauce.

**Meat Pie**—The cover of the meat pie may be pie crust, baking powder biscuit dough, or mashed potato.

**Steamed Cornmeal Pudding**—Virtually, a sweetened cornbread mixture which is steamed and served with sauce.

## CENTRALIZED SCHOOL OFFERS ADVANTAGES FOR SHOP TRAINING

ELDON L. USRY, Department of Manual Training, Ohio State University

EVERY farmer needs to have some mechanical knowledge and skill and the ability to apply it to the practical work of the farm. In these days of intense specialization there is too great a tendency to bend all of our efforts toward one specialized part of a great industry. Under certain conditions this is essential but the farmer cannot be so narrow a specialist, but rather a broader type, able to do practically all of the work required on the average farm.

Such a conception of the farmer's work means that he must have mechanical knowledge and skill and that he be able to apply these to the work at hand. No better place or institution for acquiring these is offered than the centralized school.

Today is an age of machinery and mechanical devices. No up-to-date farmer tries to run his farm in the same way that his father did. He depends largely on machines, the tractor, the stationary power plant and the automobile. Concrete is coming largely into use, not only in its simplest but in the reinforced forms for construction work, hence the farmer needs to know about concrete construction in its various branches related to the farm. Farm tools must also be kept in repair which requires a certain amount of skill in wood working and forge craft. Certain frame structures are required from time to time and so a reasonable knowledge of carpentry is necessary. The modern farm is equipped with running water and often with gas and electricity. A knowledge of pipe fitting and the laws governing hydraulics and pressure, as well as a practical

knowledge of the use of electricity and electrical wiring is much to be desired.

No school building housing the academic side of educational work is provided properly for this work unless there is an adjoining shop building. This need not be finished off like the school building but should be similar to a building for shop use on the farm. Plenty of light, good ventilation, provision for heat, a good floor and a storage room are desirable. It should be large enough to provide for benches, forges, equipment for pipe and electrical work and in addition a large open space in the center for threshers and tractors. A space of this character would allow work of a practical nature to be brought into the shop. Certain types of construction work such as concrete from work and wagon repairing or rebuilding could be done in a practical way.

Whenever possible the boys should be taken to adjoining farms where they are constructing farm buildings, laying cement walks or making concrete foundations and feeding floors. They can help do necessary pipe fitting and electrical work or repair installations already made. It is advisable, however, to bring as much of the work to the shop as is practical, such as machines to be overhauled or repaired, and articles to be used about the farm.

The fundamental purpose of this shop training should be to give the boy, the necessary instructions to make him as independent as possible of taking machines to the repair shop or to do any odd jobs on the farm, which often require but little time. The tendency is to neglect such things resulting in a

state of repairs about the farm which leads one to look upon the manager as a shiftless, careless individual. Shop training should help to overcome this characteristic and help the future farmer to run his business on the same basis of efficiency as the factory or any other business.

In equipping the shop building, the carpenter's benches should be arranged along one side. One of them should be at least 12 feet long and the others 5 or 6 feet in length. A vise such as is fitted to the regular carpenter's bench should be installed on each. These benches can be made by the student under the direction of the shop teacher. It is not necessary to have a complete set of tools at each bench but the following are the essential ones:

One 8-inch try square, 1 18-inch by 24-inch framing square, 1 12-inch 12 point back saw, 1 8-inch draw knife, 1 jack plane (metal bed),  $\frac{1}{4}$ -inch,  $\frac{3}{8}$ -inch and  $\frac{1}{2}$ -inch auger bits,  $\frac{1}{8}$ -inch,  $\frac{5}{32}$ -inch,  $\frac{3}{16}$ -inch and  $\frac{7}{32}$ -inch twist drill for wood, 1 plain brace (Spofford pattern), 1 iron counter sink, 1 nail set, 1 marking gauge, 1 6-inch screw driver, 1 mallet, 1 No. 12 bellface claw hammer.

Other necessary tools should be kept at the main bench where the students can get them when needed.

One corner of the shop building should be provided with two forges. I would recommend hand blown air blasts. The main essential in a forge is a tuyere deep enough to give a good heat. A shallow tuyere will not allow sufficient heating of the air to properly heat the iron or steel. Anvils of good size should be provided. The necessary tools for this work are the blacksmith

vice, 2 ball pein hammers about  $1\frac{1}{4}$  pounds, a 2-inch flatter,  $1\frac{1}{4}$ -inch,  $\frac{3}{8}$ -inch and  $\frac{1}{2}$ -inch top and bottom swedges,  $\frac{1}{2}$ -inch top and bottom fuller, a hot and cold hardy, a hot and soft cold chisel and an 8 pound sledge. Proper tongs for flat and round work should be provided. A cooling tub is necessary, also some provision for storing the coal in a dry place.

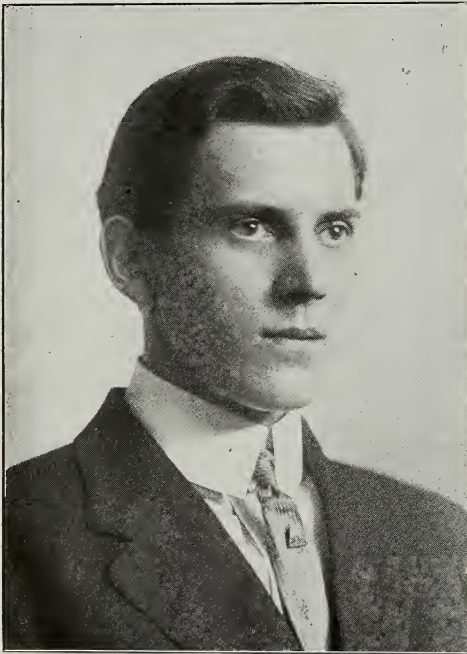
A long bench on the opposite side from the carpenter benches, should be provided, upon which to do vise work. This bench should be so situated that one of the vises placed upon it may have a pipe jaw, allowing for a length of pipe to be inserted. The necessary hammers, wrenches, files, taps, dies, reamers, tin snips, soldering copper, blow torch and clippers are essential. A post drill and machine drills are essential, either operated by hand or if a gas engine is used, power can be taken from the line shaft. The carborundum grinding wheel and lathe can be operated from the same shaft. Power grinding ought to be taught as it is a time saver, and with it better work can be done.

No shop training is complete without some mechanical drawing, so the student will be able to make a sketch of any part of the machine and properly dimension it. He should learn to read blue prints both architectural and mechanical, and learn how to take off a bill of material from a blue print or sketch. The problems or projects covered in the work should be of a nature that will be adaptable to the farm and community and develop in the boy skill and knowledge so that he will be able to solve any of the problems which ordinarily arise on the farm.



## Alumni What The Busy Grads Are Doing

A life full of fruitful promise for noted worldly accomplishments has passed away. The more recent students of the College of Agriculture remember the person of Francis H. Phillips, his abilities as a student and as an unusu-



ally active worker in numerous organizations, and his constantly pleasing, amicable disposition toward all of a large and ever increasing circle of friends and acquaintances.

Born May 31, 1890, at Cincinnati, he received his early education in the schools of that city. Associations and inspiration from a rural environment

on the home farm in Jackson County led him to enter the College of Agriculture in 1911. There in scholastic standing he was successful, and as a coworker in the organizations for the advancements of the best causes of student life he attained a rank that few men have equalled.

It was during his third year, when he was striving most zealously in the interest of *The Agricultural Student*, that ill health caused him to discontinue his college course. At that time the magazine said editorially: "Every student expresses a regret in the loss of such a man as Mr. Phillips, who always had the best interests of the college at heart, who always showed a loyal spirit for his Alma Mater, and who was truly a representative student of the Agricultural College."

The keen interest he took, after leaving college, in the activities of his Alma Mater and in his chosen field can but substantiate the statement made then. Cheerful and hopeful even to the end, on March 20, after a struggle of 3 years to regain his health and strength, he was loved and honored by his relatives and friends. Thus closed untimely a hopeful young life, but the memory of that life can never die with this generation.

L. L. RUMMELL.

Among the alumni who have been appointed as temporary county agents to assist in the food campaign in Ohio are the following: F. W. Ives, '06, in Athens, Hocking and Perry; Herbert L. Andrew, '15, in Auglaize and Shelby; Schuyler N. Salisbury, '13, in Belmont, Harrison and Jefferson; George L. Schuster, '16, in Brown and Butler; George E. Boltz, '10, in Carroll and Tuscarawas; Walter E. McCoy, '12, in Clark; Thomas G. Phillips, '12, in Columbiana; J. W. Hammond, '06, in Crawford and Morrow; True Houser, '06, in Darke; Robert R. Barker, '16,

in Gallia and Meigs; Emmett J. Hoddy, '09, in Greene; Thomas B. Foster, '06, in Highland; Carl A. Gearhart, '13, in Holmes and Wayne; Thomas D. Phillips, '10, in Logan and Union; Ray F. Donnan, '14, in Lucas; Floyd DeLashmutt, '16, in Monroe, Morgan and Noble.

The following members of the faculty of the College of Agriculture who are not alumni have also been selected as county agents: Earl C. Sleeth and G. M. McClure of the soil department; J. I. Falconer of the rural economics department; J. L. Hutchinson of the agricultural chemistry department; Joel S. Coffey and F. S. Jacoby of the animal husbandry department, and V. H. Davis of the horticultural department.

Leon M. Evans, '16, was married on April 10 to Miss Florence Brown of Rocky Ridge, Ohio. They will be at home on the farm where Mr. Evans has been since graduation.

Harry C. Ramsower, '06, who is head of the agricultural engineering department of the Ohio State University, has been placed in charge of the high school and college student employment bureau in the food campaign. This is one of the most difficult tasks in the campaign and is quite an honor to Mr. Ramsower.

Edwin G. Hibbs, '14, has been employed as agricultural agent for Columbiana County with headquarters at Lisbon. His work begins June 1. Mr. Hibbs was graduated from Scio College in 1911 and from the Ohio State University in 1914. Since his graduation he has spent part of the time in demonstrational work and part of it as an instructor and director of the agricultural department of the state high school at Albert Lea, Minnesota. He is a native of Harrison County.

Fred W. Taylor, '00, who has been up among the hills of New Hampshire

since 1903, was recently appointed assistant to the president of New Hampshire College at Durham, N. H. The new position was created on account of the ill health of President Fairchild and is a distinct promotion for Mr. Taylor who formerly held the position of dean of the agricultural division.

Edwin H. Krause, '16, is temporarily employed as a cheese maker in a factory at Waldo, Wisconsin.

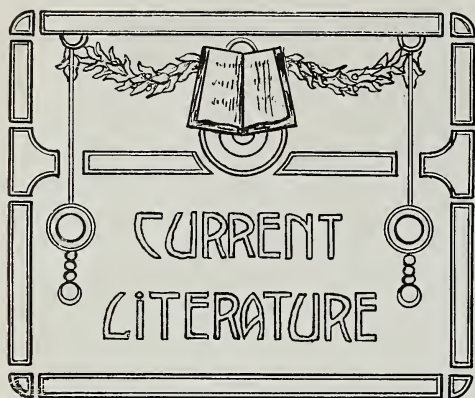
Norman E. Shaw, '06, has recently been appointed secretary of the state board of agriculture to succeed George A. Stauffer who resigned in January, but remained temporarily when requested to do so by the chief executive and the board of agriculture. He assumes his duties May 1.

Mr. Shaw was born and raised on a farm at New Richmond in Clermont County, Ohio. He attended Doane academy at Granville and later went to Ohio Northern University after which he took his course in the College of Agriculture graduating in 1906. While in college he worked his way thru by taking charge of the greenhouses and gardens of the University and during his last year was a student assistant.

After graduating he entered the service of the board as a deputy inspector of nurseries and orchards. Two years later he was appointed chief inspector of nurseries and orchards which office he has held continuously since. He is president of the Ohio State Horticultural Society and is prominent in the affairs of the national horticultural society. He is secretary of the national association of apiary inspectors and is a member of the American Association of Economic Entomologists.

When under the new law which becomes effective in June, the powers of the secretary are increased, the title of the office will be "secretary of agriculture."





"The Potato" by Arthur W. Gilbert, professor of plant pathology, Cornell University, is a book written for the practical farmer and student who may wish concise information on the different phases of potato growing without having to read many sources of information. In this work are taken up the method of improvement of the crop by breeding and selection; the factors influencing production as soil, climate, rotation of crops, use of manures and fertilizers, time of planting and insects and diseases. Chapters are also devoted to harvesting the potato, markets, marketing and storage and to the uses of the potato and to the cost of growing the crop. A large proportion of the book is given over to the subject of breeding and varieties. 318 pages, \$1.50. The Macmillan Company, New York.

"The Joyous Art of Gardening" by Frances Duncan, is a book designed to serve as a first aid to the beginning gardener and is intended especially for the owner of the small place who plans and makes his own garden and whose means and time are not unlimited. The suburban garden, the garden in town and the backyard gardens are given special consideration after which different methods of gardening practices are taken up. Directions are given for

planning the farm, for pruning and setting out of plants and shrubs, making cold frames, and transplanting. 239 pages, \$1.75. Charles Scribner's Sons, New York.

"How Farmers Cooperate and Double Profits," by Clarence Poe, is a treatise in which is given first-hand reports on the leading forms of rural cooperation in the United States and Europe. It does not merely tell what might be done in the way of cooperating but what has been done. The author has traveled widely and describes from actual experience the work of these different organizations. Among the organizations described in the book are the Grange, the Farmers' Union, Irish rural societies, Cotton Marketing Association of Arkansas, citrus fruit organizations of Florida and California and others located thruout the country. 244 pages, \$1.50. Orange Judd Company, New York.

"The Feeding of Animals," one of the rural textbooks series, has been newly revised by the author Whitman H. Jordan, director of the New York Agricultural Experiment Station. The book as with the former edition is divided into two parts. Part I deals with the general principles of chemistry that bear upon nutrition. In part II the practical side of feeding farm animals, with special attention to the principles related to the nutrition of the various classes, is taken up. Tho the material in this volume is especially well adapted for the use of the student with a knowledge of bio-chemistry it is still treated in a way that it can be a valuable treatise to the practical farmer who is familiar with the general principles of agricultural science. 473 pages, \$1.75. The Macmillan Company, New York.



## SHEEP MEN HOLD MEETINGS ON UNIVERSITY CAMPUS

REPRESENTATIVE sheep men from all parts of Ohio and some from outside of the state, gathered in Columbus, Ohio, on April 10 and 11 to attend the sheep meetings and shearing contests conducted by the Ohio State University, the Ohio Agricultural Experiment Station and the Ohio Association for the promotion of Pure Bred Sheep, which were held on the O. S. U. campus.

country to obtain their sentiments concerning the dog evil. The opinion was universal that the unrestricted dog is the worst enemy to the sheep industry and is the principal cause of so marked a decrease in the number of sheep kept on the farm." The moral effect upon all people who have seen sheep killed or injured is often more destructive than the actual damages sustained.



**View of Sheep Shearing Contest**

"There is a real necessity for something to be done to increase the number of sheep in the farming sections of the country and the dog evil is one of the fundamental questions to be considered in doing this," said Mr. A. C. Bigelow, President Philadelphia Wool and Textile Association in his address on Tuesday. "The campaign was begun," he continued, "by sending out letters to prominent sheep breeders and persons interested in wool and mutton production over the whole

The next step taken was to awaken interest and sentiment against the sheep-killing dog. Thru the instrumentality of Mr. Bayard, Editor of the National Stockman and Farmer, a dog conference was held at Harrisburg at which time a bill was drawn up to be submitted to the State Legislature of Pennsylvania. Ten states including Iowa, Arkansas, Missouri, Vermont, Connecticut, New York, Rhode Island, and Ohio have passed dog laws of a stringent nature. The bill before the

Pennsylvania Legislature provides for licensing of dogs, wearing of the license, seizure of stray dogs bearing a license and the killing of all dogs not wearing a license. It also contains a kennel clause and permits the killing of any dog found worrying domestic animals including fowls.

"The mere enactment of a law does not settle the matter," said he, "Everybody must get behind it and see that it is enforced—we must appeal to self interest, to the pocketbook and show people that it is their loss to have dogs

they increased in the West until now four western states furnish 30 percent of the clip of the United States. Some of the large pasture lands of the West are now being taken by the Government to be turned into smaller farms which will materially decrease the amount of pasture and therefore the number of sheep in the West.

"The production of wool is decreasing in Australia and Argentina. The wool stock of the world is at low ebb. Much of the old clothing is ground up and comes out again as new, but such



David Fyffe, Frank Kleinheinz

roaming around in sheep-raising districts."

"Economic Waste" is the creed adopted by the Philadelphia Wool and Textile Association in the campaign. They maintain that the unrestricted dog is a cause of the decrease in supplies of meat and wool and for the increase in the cost of living. The unrestricted dog is therefore a direct tax on every citizen and a destructive economic parasite. He has absolutely no value, but is in fact a liability and a menace, to be classed with hog cholera, tuberculosis, cut worm and blight.

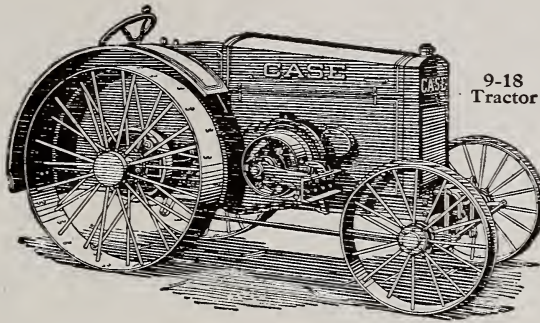
As flocks have decreased in the East

will not be the case with the soldiers' clothing. Every one that returns will have to be fitted out anew with civilian clothes. This will prevent the wool market from ever going down again to such a low price as prevailed a few years back. Hereafter wool will be sold on a basis of value," said Mr. Bigelow. "We are giving the sheep raisers the time of their life to get back in the business."

#### Careful Selection Emphasized.

That farmers can increase the clip of wool by the careful selection of rams and ewes was shown by J. W. Hammond of the Ohio Agricultural Experi-



9-18  
Tractor

## Study CASE Tractors In the Field

Ask your nearest Case tractor dealer to show you one of our tractors. Let him explain to you in detail the superior features in these tractors.

Then see these tractors in the field. Watch their performance. Note their efficiency, their economy, their serviceability.

*Study* them. Compare Case with others. The more you know about Case tractors and the more you compare them with others, the better you will understand why Case dominates.

There are five sizes of Case tractors—9-18, 10-20, 12-25, 20-40 and 30-60. This means a size for every size farm.

Write us today for our new tractor literature. It gives you



complete information regarding our tractors. Everyone studying farm work should know all about Case tractors. You will find that knowing all about Case will be a great help to you when you have your own farm. Write for full information today.

**J. I. CASE THRESHING MACHINE COMPANY, Inc.**

Founded 1842

525 Erie Street, Racine, Wis.

# CASE

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



ment Station in an address delivered before the Shepherds' Roundup. The experiment he described, was begun in 1909 with 108 grade Delaine ewes which were divided in 3 lots. These were then bred to 3 rams and the following results secured for a period of 3 years.

| Ram        | Average wt. of<br>2nd fleece from<br>lamb's (sired<br>by ram.) | Average wt. of<br>fleece of ewes<br>bred to ram. |
|------------|----------------------------------------------------------------|--------------------------------------------------|
| No. 1..... | 7.34.....                                                      | 9.30.....                                        |
| No. 2..... | 7.25.....                                                      | 9.43.....                                        |
| No. 3..... | 6.97.....                                                      | 8.17.....                                        |

practiced by some farmers with satisfactory results. When the good sire has been found he should be kept as long as possible. Mr. Hammond also emphasized the fact that good quality in the ewes and rams is more important than the mere fact that they are pure-bred.

#### Other Speakers.

George M. Wilbur of Marysville, Ohio, spoke on "The East Against the West as a Source of Sheep and Wool." He stated that this was the first year



Judges (left to right): Tom C. Stone, Frank Kleinheinz, Harry E. Allen

The following table gives the results of using high shearing ewes.

| Average weight<br>of ewe's fleece. | Average weight<br>of lamb's fleece. |
|------------------------------------|-------------------------------------|
| 8.30 .....                         | 9.46 .....                          |
| 6.14 .....                         | 8.73 .....                          |

The highest shearing ewes were then bred to the highest shearing ram and the lowest shearing ewes were bred to the lowest shearing ram with the following results:

| Ram        | Weight of<br>ewe's fleece | Weight of<br>lamb's fleece |
|------------|---------------------------|----------------------------|
| No. 2..... | 8.33.....                 | 9.71.....                  |
| No. 3..... | 5.96.....                 | 7.91.....                  |

Altho this method of breeding requires care and extra work it has been

that he had ever shipped any sheep west and that the east is coming to be the future source of sheep and wool. Professor H. E. Allen of Purdue University gave a demonstration in judging mutton sheep and J. A. Willingmyer, a specialist from Riverton, New Jersey, demonstrated the grading of fleeces. "The Practical Management of the Flock" was discussed by Professor Frank Kleinheinz of the University of Wisconsin. E. S. Bayard, editor of the National Stockman and Farmer was one of the speakers at the afternoon session.

#### Shearing Contest.

The sheep shearing contest which



# His First Lesson



The farmer of today proudly teaches his son what his own father taught him—to use a John Deere Plow.



## Fellows:

Ordinarily a farm implement doesn't furnish a theme for sentiment—it usually suggests hard work.

But back home there is, in all probability, an old John Deere plow which your grandpapa, dad and perhaps you yourself have followed down many a long furrow—and it will be treasured all the more as the years go by.

Each implement bearing the John Deere trade mark—and there's a John Deere imple-

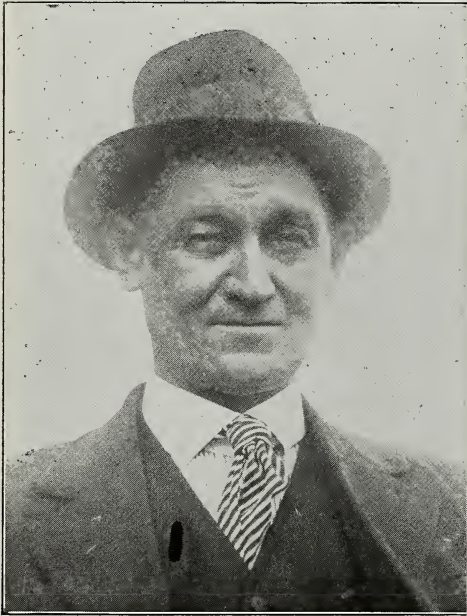
ment for every kind of work on the farm—has incorporated in its makeup the same qualities that made your granddad swear by that old John Deere plow.

You may be thinking of getting some new implements when you have finished school—you'll at least want to be in a position to recommend the best and latest in farm machinery. We'll be pleased to send you literature describing any special tool you are interested in, if you'll write.

JOHN DEERE, Moline, Illinois.



was the ninth annual event of its kind conducted by the agricultural college had primarily for its object the showing of correct and humane methods of handling and shearing sheep and the tying of wool.



**G. A. Shaw, Marengo, Ohio**

The shearing events were 5 in number and included shearing with hand machines, hand shearing by professionals, hand shearing by amateurs, speed exhibit of shearing with a hand machine and a contest for efficiency of workmanship. In grading the contestants, the handling of the animals, use of the shears, time consumed in shearing, cuts or injuries made to the body and character of preparation and tying the fleece were taken into consideration.

The first prize with the hand shearing was won by F. P. Elliot of London, Ohio, with G. A. Shaw, Marengo, Ohio, second, and L. A. Long, Loudonville, Ohio, third. In the power machine event G. A. Shaw took first, J. A. Parthemore, Marengo, Ohio, second,

and Carl Fife, Mt. Fairfield, Ohio, third. The hand shearing contest was won by G. A. Shaw. Edward Wilcox, Delaware, Ohio, took second, and J. A. Parthemore third.

The event for amateurs with hand shears was won by H. L. Rex, Zanesville, Ohio, with Wallace L. Hammond, a junior in the College of Agriculture second. First honors in the efficiency of workmanship went to G. A. Shaw with J. A. Parthemore second.

Forty-seven pounds and 12 ounces was the remarkable weight of wool in the fleece shorn from S. M. Cleaver's purebred Merino ram, Gold Coin, Jr., during the day of the contest. According to Professor Plumb this is the record for Ohio and stands second for a world's record. Gold Coin, Jr., is val-



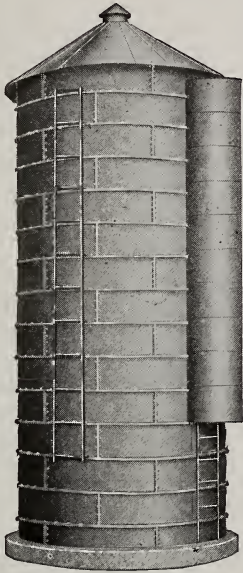
**Gold Coin, Jr.**

ued at \$1500 by his owner who has a large flock of Merinos on his farm near Delaware, Ohio.

The judges for this contest were Tom C. Stone, Ohio State University; Professor Frank Kleinheinz of the University of Wisconsin; Professor Harry E. Allen of Purdue University; J. W. Hammond, Ohio Agricultural Experiment Station, and S. G. Palmer, Pataskala, Ohio.

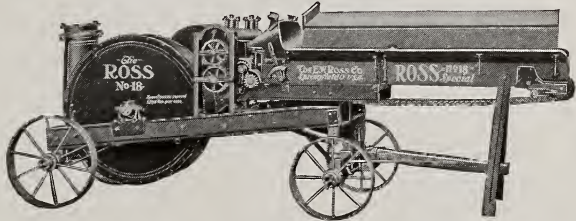


# TAKE OUR ADVICE



Whoever contemplates buying a silo or silo filler better get busy and place his order now and have it shipped at once. PRESIDENT WILSON'S requests are being carried out by the Dairymen as well as the Cattle Feeders, resulting in more demand for silos and silo fillers, so much so that there will not be enough of either to go around. We can at the present take more orders for

**ROSS SILOS (Wood or Metal)  
SILO FILLERS**



Address all communications to

**The E. W. ROSS CO. SPRINGFIELD OHIO**

Est. 1850 (67 Years Experience).

## A Letter to Cream Producers

How many cans of Cream that you have sold have you actually tested for Butterfat content?

Don't you think you should know what your Cream tests as well as you should know what a load of hay weighs that you sell? While a can of cream is but a small amount compared with a load of hay, yet you probably get more dollars for Cream than for hay.

If you were offered \$2.00 or \$3.00 above the market price for hay, wouldn't you feel that it would be necessary for you to see it weighed? Isn't it a fact that a top heavy price means questionable methods of dealing?

We leave these thoughts with you for your earnest consideration.

## The West Jefferson Creamery Company

Columbus, Ohio—Zanesville, Ohio.

### **ASSISTANT COUNTY AGENT LEADER.**

A. E. Anderson, state leader of county agent work at the University of Nebraska, has accepted an offer to become assistant county agent in Ohio to become effective June 1. He is a graduate of the University of Nebraska in the class of 1911. He has been engaged in extension work almost the entire time since graduation. Previous to taking up county agent work, Mr. Anderson visited Europe for the purpose of studying the methods and practices of the European farmers.

---

### **MILITARY AND ATHLETIC FIELD.**

Ninety acres have been set aside by the Ohio State University trustees for an athletic and military field. This includes the land between the university campus and the Olentangy river. The plans provide for an armory, a stadium, 15 baseball diamonds, 48 tennis courts, and a mile boating course on the river. As soon as the athletic board can furnish a satisfactory financial plan, a \$300,000 stadium will be erected that will seat 53,000 people.

To replace the land taken for the athletic and military field, 96 acres will be purchased with money appropriated by the legislature.

---

### **OFFER TO ASSIST GARDENERS.**

Thousands of copies of "The Vacant Lot and Backyard Gardener's Handy Guide," have been distributed recently by the extension service in an effort to satisfy the demand for information on gardening. Quantities of these will be mailed without cost to public officials or organizations who will see that they are properly distributed. Copies may be secured at the offices of county agricultural agents or by writing to the Ohio State University, College of Agriculture, at Columbus.

The pamphlet contains directions for the production of all the common garden crops and a diagram showing a suggested arrangement of crops and the space to be devoted to each in the average sized garden. Persons desiring to make a more extensive study of gardening should enroll in the correspondence course in vegetable gardening given by the College of Agriculture without cost or entrance requirement. This course takes up the study of soils, fertilizers, irrigation, tools, control of diseases and insects and the culture of the common garden crops.

---

### **ASSISTANT HORTICULTURIST.**

Frank Beach, assistant professor of horticulture at Purdue University, has been appointed specialist in horticulture to assist R. B. Cruickshank after July 1.

Mr. Beach is a son of S. A. Beach, head of the department of horticulture at the Iowa State College of Agriculture. He is a graduate of that institution and for the past 2 years has been at Purdue University where he has been engaged as an instructor and extension worker.

---

### **BACK TO THE FARM.**

Realizing the great need of help on the farms the faculty of the university passed a ruling that any student may withdraw from the university with full credit for this semester's work if he would pledge himself to work on a farm until the beginning of school next fall.

As a result of this over 600 students have left the University. Many classes have been disbanded and there are very few left in the others. All of the agricultural fraternities have been forced to close their houses. The College of Agriculture, which has furnished most of these students, truly seems to have been deserted. But they are out in the



# TENNIS

## Rackets, Balls, Shirts, Shoes and Hose

### H. K. SMITH & CO.

TWO STORES

15th and High

11th and High

## **D**EWY'S READY RATION

**Guaranteed Analysis**  
**25% Protein, 6% Fat, 10% Fibre**

**COMPOSITION:**

|                               |                        |
|-------------------------------|------------------------|
| Eagle Distillers Dried Grains | Wheat Bran & Middlings |
| Choice Cotton Seed Meal       | Pure Hominy Feed       |
| Linseed Oil Meal              | Malt Sprouts           |
|                               | $\frac{1}{2}\%$ Salt   |

Dewey's Ready Ration produces large milk flow. Dairy cows eat it greedily. Keeps them in good flesh—the pink of condition. Feed Dewey's Ready Ration and get

## MORE MILK

*better milk—at less cost.* Feed it with home-grown hay, straw, fodder, ensilage, roots. Forms perfectly balanced ration. No other grain or feed necessary. Scientifically blended from highest grade feeds to produce most milk at smallest cost. Bulky and palatable. Easily digested and assimilated. Contains nutrients that make milk. Increases dairy profits. ABSOLUTELY GUARANTEED. Ask your dealer or write us for sample and information. Mention your dealer's name.

**THE DEWEY BROS. CO.**Box 577 **Blanchester, Ohio**

## C. S. MEAL MILL FEEDS

Always get our prices before buying elsewhere. Mixed cars a specialty. The D. B. Co., Blanchester, Ohio.

## DISTILLERS' DRIED GRAINS

The only high protein concentrate that is safe to feed in any quantity for any time. Contains about 80 lb. digestible matter per cwt. Fine for cows, steers and sheep. Did you know that in every Exp. Sta. Test where D. D. Grains were compared with C. S. Meal and Oil Meal in feeding steers D. D. Grains have always produced the most economical gains. The D. B. Co., Blanchester, O.

## For Corn and Cotton

and for other row crops, too, the CUTAWAY (CLARK) Harrow is your handiest implement. The gangs may be spaced to cultivate close to the plant and are reversible. Light draft, simple and strong. Disks of cutlery steel forged sharp. You'll like the many other features in the

### Cutaway (CLARK)

#### Corn and Cotton Harrow

The real labor-saving, profit-making implement for diversified farming. If your dealer has not the genuine CUTAWAY, write us direct. Write now for our new free book, "The Soil And Its Tillage."

**The Cutaway Harrow Company**

*Maker of the original  
CLARK disk harrows and plows*  
2114 MAIN ST., HIGGANUM, CONN.



Please mention THE AGRICULTURAL STUDENT when writing advertisers.

fields where the opportunity will be given them to show the worth of a college education.

### HORSE SHOW CALLED OFF.

On account of the fact that so many of the students have left school the annual horse show has been called off. This will be a disappointment to those who have looked forward to the event with anticipation and it was with regrets that the Saddle and Sirloin Club decided that it could not be held under present conditions.

### PRISON CAMP RELIEF.

With a voluntary contribution of \$5,500, the Ohio State University ranks second in the donated sum for the relief of men in prison camps of Europe.

Yale, with \$5,500 takes first place in the donations which aggregate a total of \$120,000. The list of universities donating \$1,400 or more is as follows: Yale University, \$5,500; Ohio State University, \$5,500; Williams College, \$4,710; Dartmouth College, \$3,810; Oberlin College, \$3,500; Iowa State College, \$3,400; University of Minnesota, \$3,350; University of Chicago, \$2,850; Cornell College, \$2,160; South Dakota State College, \$1,810; University of Texas, \$1,400.

Isaac S. Cook, '06, is agronomist at the West Virginia Agricultural College and Experiment Station at Morgantown, W. Va.

Glen E. McCoy, '15, is superintendent of the John Wildi Evaporated Milk Company plant at Bainbridge, Ohio.



**Sulfocide**  
MAKES US SMILE

Trade Mark

**A Powerful Fungicide for Fruits, Vegetables and Flowers**

Peach Leaf Curl, Brown Rot, Apple Scab, Grape Mildew, Potato Blight, Cucumber Wilt, Bean Blight, Rose Mildew, etc.

Most inexpensive. 1 gal. makes 200 gals. spray. \$1 to \$2 per gal. according to size package.  
Booklet free.

B. G. Pratt Co. Dept. 28. 53 Church St., N. Y. City



**Fertilize Spring Crops**

Increase Yields  
Improve Quality  
Hasten Maturity  
Maintain Fertility

Plan your 1917 work so as to get the most money from every acre. Lower costs per bushel for plowing, seeding, interest and labor result when crops are well-fed. *Fertilizers will pay on your spring crops.* Higher prices for farm products make profits from using fertilizer larger than ever before.

Send for our free Crop Bulletins.  
Ask us your fertility questions.

**Soil Improvement Committee**  
of the **National Fertilizer Association**

Postal Telegraph Bldg. Munsey Bldg.  
Chicago, Ill. Dept. 206 Baltimore



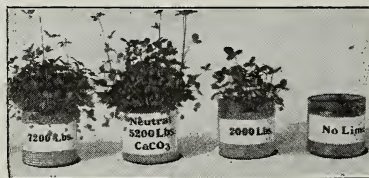
Order early on account of car shortage.

**Liberal Proposition to Agents.**

**THE MARBLE CLIFF QUARRIES CO., Columbus, O.**

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

Write today for the best free booklet published telling how Ever Sweet sweetens the soil and increases production.





# GOODMAN BROTHERS JEWELERS

No. 98 NORTH HIGH ST.

Cor. 11th Ave. and High      Special "Office" Rates      The "Student" Laundry

## PROGRESS LAUNDRY

*Dry and Steam Cleaning, Pressing*

Our Tailoring Department is complete. 500 Patterns on which we can save you money.

## For Those Who Care

College Jewelry, Souvenirs, Umbrellas, Canes  
Beautiful Silk Parasols, Guaranteed  
Boston Bags      Suit Cases  
Best Felt Hats \$2.00

**LEHMAN'S,** 1666 N. High St.

Dry or Steam  
Cleaning  
Pressing

**WE  
DELIVER  
BOTH PHONES**

Better  
Tailoring  
for Less

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

# Prof. W. J. Rader's Private Academies of Dancing



Dance Correctly.

## NEIL AVE. ACADEMY

647 Neil Ave. Phones: Citz. 4431; M. 6189.

### MAY DANCING CALENDAR

**Beginners' Class**—Friday evening, May 11.

**Advance class** Monday evenings.

**Reception Night** Thursday evenings.

**Reception Night** Saturday evening (front hall).

**Neil Ave. Pavilion**—Open Tuesday, Friday and Saturday evenings.

## OAK STREET ACADEMY

827 Oak St. Cit. Phone 7105; Res. Phones: Cit. 4431; M. 6189

A strictly private place for Club Dances and Private Classes that organize for special instructions.

**TUITION:** Gentlemen per term of 10 lessons, \$5.00; Ladies, per term of 10 lessons, \$4.00; Private Lessons, \$1.00; six for \$5.00. Tuition can be paid \$1.00 per week until paid.

Private lessons can be had afternoon or evening.

The Waltz, Two-Step and the late modern dances taught in one term.

# Decoration Day and Commencement Day ARE NOT FAR AWAY

You begin to take up the real issues of life. You have acquired knowledge that you will put to practical use:

The value of being well dressed becomes apparent to you. Have your clothes hand-tailored, cut to your individual measure.

Here on display is an assortment of fabrics that will make clothes that will contribute toward your success.

As a suggestion, come here and see our beautiful line of Serges, Unfinished Worsteds and Worsted Cheviots that will make a beautiful suit for this occasion, and give you an abundance of wear throughout the season.

## Bradley —The— Tailor "So-Different"

O. S. Tel. 16796.

High St. at Tenth Ave.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



# HAVE THE BEST

Visit The Old Reliable

*Baker Art Gallery*  
COLUMBUS, O.

State and High Streets

The largest, finest, and without doubt the finest equipped Gallery in America for producing everything known to the art.

SPECIAL O. S. U. RATES

## THE FRAT THEATRE

Owned and Operated by O. S. U. Students

Eleventh and High Sts.



**BLOCK FLORAL CO.**

QUALITY FLOWERS  
FOR ALL OCCASIONS

Write—Telegraph—Telephone

FLOWERS SENT ANYWHERE

Citizens Phone 11496

## Trophy Cups and Medals



**BASCOM BROS.** 1585½ N. High St.  
COLUMBUS, O.

**ORR-KIEFER****COLVMBVS.O.****Orr-Kiefer Studio Co.**

199-201 SOUTH HIGH STREET

***Artistic Photography****"Just a little better than the best"***SPECIAL RATES TO STUDENTS***We Frame Pictures of all kinds—RIGHT*

**HENNICK'S** *The one place around*  
**CONFECTIONERY** *the campus where you*  
*can get good things to*  
*eat and drink.*

## EMERSON ACADEMY OF DANCING

HIGH AND WARREN

Margaret Naddy Turkopp extends Ohio State students and their friends the most cordial invitation to attend her Academy of Dancing, assembly nights being Thursday, Friday and Saturday.

Friday night, exclusively College and High School age.

### CALENDAR OF 1916-1917

**Afternoon Lessons**—Monday and Friday, 3:30 o'clock.

**Class Lessons**—Adults: Monday, Tuesday and Wednesday evenings, 7:30 o'clock. Tuition, 10 lessons, \$5.

**Assembly Dancing**—Every Thursday and Saturday evening, 8:10 till 11 o'clock. Orchestra.

**Private Lessons**—By appointment.

**Children's Classes**—Saturday afternoons from 2 till 4, 30 lessons, \$10.  
For information call

**MARGARET NADDY TURKOPP**

Phones: Res. N. 4164, Citizens 11958; Academy, North 5902.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



# Renting an UNDERWOOD

## Typewriter



The popular machine of the  
Business World is an endorse-  
ment of your good judgment.

*"The Machine You Will Eventually Buy"*

**UNDERWOOD TYPEWRITER COMPANY**

98 NORTH THIRD ST. PHONES: Citizen 7267; Bell, M. 5528



COLUMBUS, OHIO.

**T**HE VILLAGE FARM offers a solid colored Bull, dropt Jan. 25, 1915. Dam, Melia's Nervilette 224,435, produced 72 lbs. 2 oz. in 30 days. Tuberculin tested. Read ✓ for shipment. Price \$100.

W.H. PRICE, Woodville, O.

## UNIFORM REMODELING

Second-Hand Uniforms for Sale

Caps, Service Stripes and Pants Stripes  
Made While You Wait.

DRY CLEANING AND PRESSING.....\$1.00  
PRESSING ..... 25c

SAM ROSEN, 1574 N. High



**APOLLO ROOFING**

Made from APOLLO-KEYSTONE Copper Steel Galvanized Sheets, the most durable, rust-resisting sheets manufactured.

These sheets are unequalled for Silos, Culverts, Tanks, Roofing, Siding and all forms of exposed metal work. Look for the Keystone added to brand. Send for our "Better Buildings" booklet.

AMERICAN SHEET AND TIN PLATE CO., Pittsburgh, Pa.

## BLACKWOOD, GREEN & CO. HARDWARE

Furnaces, Stoves and Kitchen Furnish-  
ing Goods

Slate and Metal Roofing

Auto Repairing

624 N. HIGH ST. COLUMBUS, O.

## Choice Pure Bred Live Stock

is bred by the Animal Husbandry Department of the

### Ohio State University

We breed Percherons, Clydesdales, Hackneys, Shorthorns, Jerseys, Holstein-Friesians, Guernseys, Shropshires, Merinos, Berkshires, Duroc-Jerseys, Large Yorkshires and some others. We often have surplus stock for sale at a reasonable prices.

Address, DEPARTMENT OF ANIMAL HUSBANDRY,  
Ohio State University, Columbus, Ohio.

## No Better Clothes than Mendel's at Any Price

Suits Made and Guaranteed to Fit, From \$18 to \$40.

**MENDEL, The Tailor**

545 NORTH HIGH ST., Four Doors South of Goodale St.



# Marzetti Restaurant

1548 NORTH HIGH STREET

## We Bake Our Own Pies

SHORT ORDERS OUR SPECIALTY

## E. S. ALBAUGH

Manufacturing Jeweler

TWENTY-TWO EAST GAY STREET

"The Jewelry Shop"

FRATERNITY & CLASS PINS.  
LODGE EMBLEMS.

Automatic Phone 8017

## Why Should YOU Have a Typewriter?



The "Silent Smith"  
Model 8 L. C. Smith  
& Bros. Typewriter.

BECAUSE—It will enable you to get more out of your college course.

BECAUSE—It will mean higher marks in your studies.

BECAUSE—It will add to your standing and prestige with the professors.

BECAUSE—You can keep carbon copies of notes, theses and lectures.

BECAUSE—A knowledge of how to operate a writing machine will be useful as long as you live.

The Silent Model 8 runs so quietly that you can use it without disturbing other students near you. It has many other exclusive features that you should know about. Call us on the phone or drop a card.

Special rental rates to Students. Phone or write for demonstration.

## L. C. Smith & Bros. Typewriter Co.

87 NORTH THIRD ST., COLUMBUS, O.



Insure  
in  
Prexy's  
Company

All Forms of  
Life Insurance

The Midland Mutual  
Life Insurance Co.



—FOR—  
**Cheese Making on the Farm**  
 USE CHR. HANSEN'S  
**Rennet Tablets**  
 AND  
**Cheese Color Tablets**

Also Try Our

**Danish Butter Color**

It gives that beautiful golden June shade and does not affect, in the least degree, the aroma or flavor of the butter.

CHR. HANSEN'S Rennet Extract, Cheese Color, and Lactic Ferment Culture have stood the test of time.

**CHR. HANSEN'S LABORATORY**  
 Box 1212, LITTLE FALLS, N. Y.



**DAIRYMEN!**

Is that great half of your herd, the sire, a half that will show thousands of dollars of profit? Or is he "just a bull"? Run no risks. Invest where you know the breed pays and where the registry stands for purity of type and special, concentrated purpose.

**Buy a Jersey Bull**

Introduce the blood that proves out in steady, persistent milk flow, in animals that mature early, live long, live anywhere, eat most anything and produce most economically, the richest of milk.

Read the ads of Jersey breeders in this paper—write them for prices. Send for our free book "Story of the Jersey", and plan now to build a herd you'll be proud of.

**The American Jersey Cattle Club**  
 399 West 23rd Street - New York City.

**MERIDEL FARM DUROCS**

THE POPULAR KIND

It took good sows and good boars to produce them. They came from ancestors of the **big type**. Those smooth quick feeders with strength, big bone and good action. Capable of doing their own harvesting for a large part of food from blue grass, clover and alfalfa pastures.

Always Glad to See You.

**MERIDEL FARM, BLACK LICK, OHIO**

On East Broad Street Nine and One-Half Miles East of Columbus, Ohio.  
 Where Good Sows and Good Boars Meet.

**Maple Avenue Stock Farm**

THE HOME OF THE CHAMPIONS

**HERD SIRES**

Johanna Concordia Champion, No. 60575; Duke Ormsby Pietertje De Kol 3d, No. 107737, and "The Milk & Butter Champion," No. 158089, the only bull in the world with a world's record milk producing dam and whose sire's dam is a world's record butter cow.

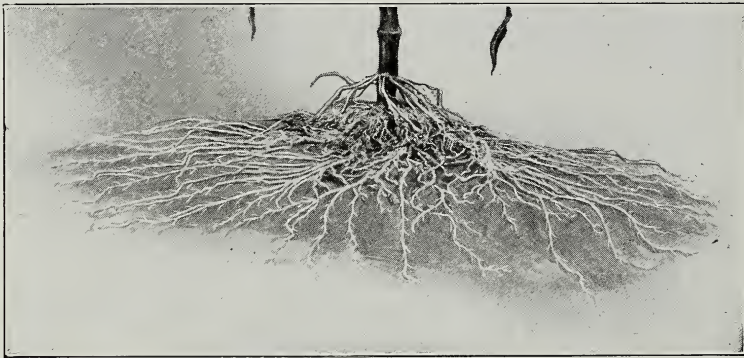
Cows and heifers bred to these great bulls, bulls and bull calves always for sale.

**L. E. CONNELL, Fayette, Ohio.**

# WAR AT HOME RIGHT IN THE CORN FIELDS

The call is imperative that every farmer do all in his power to increase the food supply for our nation and for the world. This means that crops must be improved very much in the season of 1917. This means in the corn field that not a grain of this corn now selling at \$1.25 per bushel should be lost from any wasteful method. Every farmer may now, by careful attention to preparation of the seed bed for the corn, followed by surface cultivation with our Tower implement, increase his grain yield very much over the ancient method, still too prevalent, of using sharp pointed shovels.

The attention of every farmer is hereby arrested. He must at once abandon the deliberate slaughter of corn roots, which means the waste of 15% or more of his corn crop. Read again our April announcement.



**These Corn Roots Within Five Inches of the Surface.**

Every progressive student of agriculture should be convinced from the information that has emanated from the various experiment stations, as well as the experiences of many progressive farmers, that surface cultivation is the only way to secure the maximum of a corn crop. It is important, however, that in taking up this plan of culture for the first time that one be sure to follow the manufacturer's directions very carefully.

The right method is as important in handling  
a machine in the cornfield as is the right  
way of procedure in the chemical laboratory.

The practical policy of war on wrong-doing is to protest against it and let each farmer be sure that he follows for the season 1917 a cultivator which bears the name "TOWER" on the tongue. If you are not thoroughly convinced that we are right, write us at once for our convincing literature, which is awaiting your request. Address the

**The J. D. Tower & Sons Company**  
MENDOTA, ILL.

Original Manufacturers of Surface Cultivators.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



## Living In This Age

Our grandparents looked upon soap as a very desirable means for washing food and milk utensils. They had nothing better nor knew of nothing better.

Today it would be a difficult matter to find a Pure Food Expert or a Dairy Authority recommending soap, and it would also be just as difficult to find one who did not recommend

Indian in Circle



In every package

**Wyandotte**  
Dairyman's  
Cleaner and Cleanser

This wonderful cleanser has no soapy greases or fats. It leaves no soapy odor. It is pure and purifying. It cleans clean, it sweetens, and it makes things sanitary. You are not asked to accept these statements without proof for Wyandotte Dairyman's Cleaner and Cleanser is positively guaranteed to be and to do all that is claimed for it or money refunded. Ask your dealer or order from your dairy supply man.

**The J. B. Ford Co., Sole Mfrs., Wyandotte, Mich.**

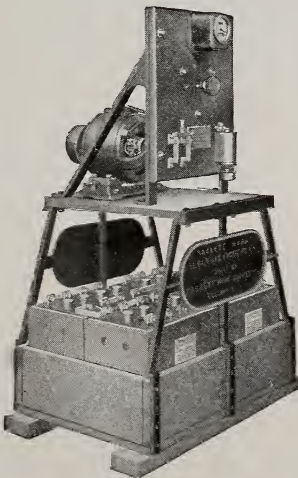
This Cleaner has been awarded the highest prize wherever exhibited.

**IT CLEANS CLEAN**

## SACKETT-HYRAY

Electric Lighting Plants

For Country Homes.

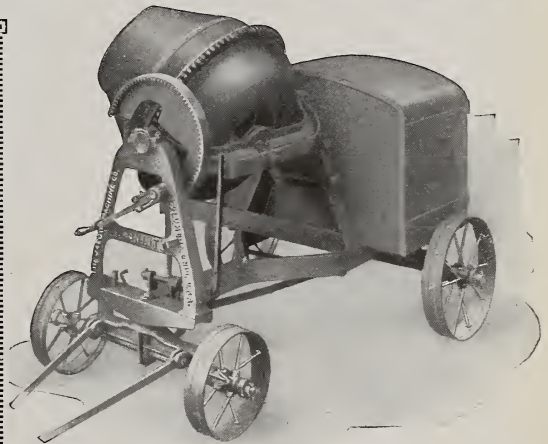


Write for Catalog.

**THE SACKETT COMPANY**

162 North 3rd St.

COLUMBUS, OHIO



## JAEGER MIXERS

**BIG-AN-LITTLE**

Are giving satisfaction to thousands. Mixers, like men, are judged by what they have done and are doing. Ask the man who runs a Jaeger—he knows.

Made in 4 sizes—14 styles.

A Mixer for Your Purpose

**THE JAEGER MACHINE CO.**

113 W. Rich St., Columbus Ohio.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



Greenhouse 40'x60' erected for The Dorval Nurseries,  
Dorval, near Montreal, Canada.

## Multiplying the Multiplication Table With a Greenhouse

**W**HY don't you start a little nursery in connection with your farm?

There's money in it.

It's a fascinating business.

Have in mind this very minute, a number of keen chaps (one a minister) who started only a few years ago with an acre or so of shrubs; who are now carrying a check book in their hip pocket instead of a bunch of jingly keys.

With some good sturdy parent stock, you can with the aid of a

greenhouse, make cuttings and propagate at a rapid pace.

One plant often gives 25 cuttings.

It has multiplying the multiplication table beaten forty ways.

When you are not using the greenhouse for propagating, grow a crop of cut flowers and have that much velvet.

Think it over.

Let us send you our Special Vegetable Growers' Circular No. 401.

### Lord & Burnham Co.

Builders of Greenhouses and Conservatories.

#### SALES OFFICES

NEW YORK,  
42nd St. Building

DETROIT,  
Book Building.

TORONTO,  
Royal Bank Building.

BOSTON,  
Tremont Building.

ROCHESTER,  
Granite Building.

CHICAGO,  
Continental and Commercial Building.

PHILADELPHIA,  
Widener Building.

CLEVELAND,  
Swetland Building.

MONTREAL,  
Transportation Building.

#### FACTORIES

Irvington, N. Y. Des Plaines, Ill.  
St. Catharines, Canada.



CALL CIT. 5647

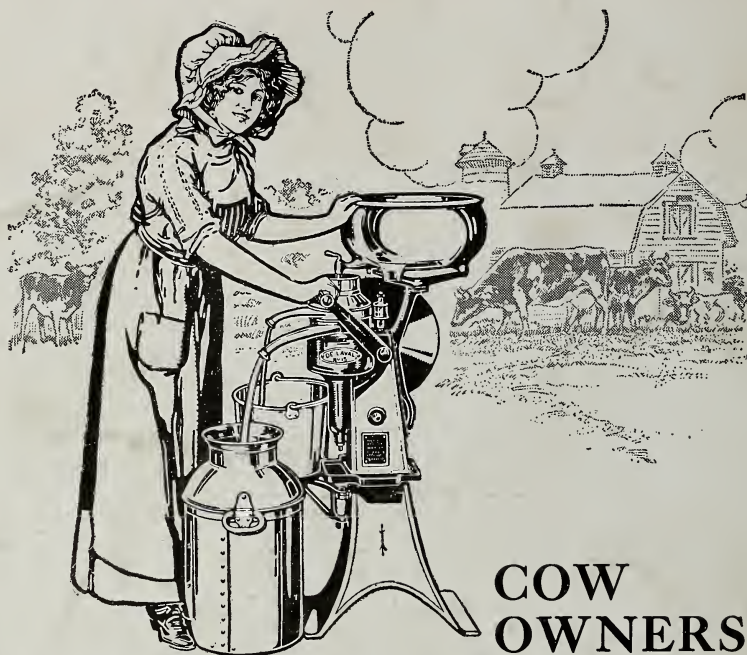
**B. D. Clement**

Brunson Building  
Columbus, Ohio

SELLING

**Northwestern Mutual  
Life Insurance**

THAT PERFECT PROTECTION  
AT THE RIGHT RATE



COW  
OWNERS  
EXPECT MORE FROM A

**DE LAVAL**

-- more cream  
-- longer wear  
-- better service  
-- better value,

**AND THEY GET IT**

A catalog of the NEW De Laval Machines will be sent on request.

**THE DE LAVAL SEPARATOR CO.**

165 Broadway, New York

29 E. Madison St., Chicago

50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER